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VETERINARY MEDICINE

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A new antiseptic drug which appears successful in ridding infected wounds of "blue pus" is called phenoxetol and is related to ethylene glycol. Phenoxetol is less effective than penicillin and the sulfa drugs in staphylococcic and streptococcic infections but more effective than they in combating *B. pyocyaneus*.

* * * *

In a test of different treatments for tonsillitis in which 405 soldiers constituted the patients, sulfadiazine produced the quickest recoveries with fewest complications. Spraying the inflamed tonsil every two hours produced best results but possessed little advantage over small doses of the same drug given orally in tablet form. The dose was 125mg four times daily.

* * * *

Spring-summer encephalitis in Russia has been determined to be due to a filterable virus which is tick-borne—various birds and rodents constituting the natural pool of infection. The virus is unrelated to that of St. Louis encephalitis and lethargic encephalitis, but bears a close relation to the virus of looping-ill in sheep. Spring-summer encephalitis has a mortality of 20 to 30% and many who recover are incapacitated by paralysis.

* * * *

In March, 1943, an outbreak of typhoid fever (440 cases and 22 deaths) occurred in Melbourne, Australia. The source of the infection was unpasteurized milk from a dirty dairy in which a typhoid carrier was employed. Although, as a result of this dramatic lesson, the physicians of the city practically unanimously demanded the pasteurization of market milk, "practical" dairymen won and the citizens are still taking a chance.

The U. S. Public Health Service reports that Sylvatic plague has progressed as far east as Oklahoma, where plague germs were found in fleas from wood rats and mice.

* * * *

Ampules of thrombin are included in Soviet soldier's field service dressings. A gauze pad soaked in thrombin applied to wounds will stop the hemorrhage in three to five seconds. The thrombin used is prepared from horse serum.

* * * *

Red blood cell concentrate mixed with jelly of tragacanth or hexylresorinol forms a paste which speeds healing when applied directly to the wound in old, infected burns, ulcers and extensive granulating wounds—it seems to supply nutritional elements or proteins to tissues lacking them.

By a process developed at the Pennsylvania State College, milk may be concentrated by evaporation, much as evaporated or condensed milk is prepared for canning, except that the concentration is carried further, the milk frozen and it keeps several months. When reconstituted by thawing and adding twice its volume of water it is said to be hardly distinguishable from fresh milk.

Reduction in Number of Laying Hens Urged

Owing to the prospect of scarcity of poultry feed and the estimated requirement for eggs next season, officials of the WFA urge a reduction of 10% in the number of laying hens now on hand in the poultry industry.

Because hens in the second and subsequent laying seasons consume more feed for the production of a given number of eggs than do pullets in the first laying season, the U. S. Department of Agriculture strongly emphasizes the advantages of eliminating the older birds in this flock reduction program.

In addition to eliminating the unprofitable, or less profitable, birds this culling of the old hens will go far to mitigate the problem of disease and parasitisms in the flocks. In the case of avian tuberculosis, a wide-spread and destructive disease of fowl in the North Central States, elimination from the flock of all birds more than one year of age, will constitute an effective measure of control and eradication. Avian tuberculosis is not a problem in areas where all fowl are disposed of at the end of the first laying season but it is a serious problem not only in poultry but also in swine where this practice is not followed.

Some years ago the Illinois State Department of Agriculture built a project for the control of avian tuberculosis in that state around the slogan "Give the old hen a ride." Although the success of the plan was amply demonstrated where it was put into effect, it made only moderate headway because the owners of most of the poultry flocks, especially the small and medium size flocks, could not be persuaded to follow the advice and market their hens at the close of the first laying season. Perhaps now that flock owners are confronted with the prospect of a scarcity of suitable feed and a possible overproduction of eggs they will be more inclined to heed the advice to keep only young hens for laying.

Officials of the agricultural department estimate that there are now on the farms 150 million hens, 18 months of age or older, and that 120 million of these should be marketed; the remainder being birds of exceptional breeding value.

Cheese-Borne Food Poisoning

A typhoid fever epidemic in Indiana the past winter, the worst in many years, was determined to be due to cheese made from unpasteurized milk.

After each donation of blood to the China Blood Bank, the separated red cells are resuspended in a dextrose solution and reinjected into the donor. This reduces the interval between donations to four weeks from eight weeks.

Cellulose Medicated Powder

A wound dressing of absorbent cellulose powder has just been developed. Cotton linters, cornstalk pith, etc., are soaked for 30 minutes in orthoboric acid, then dried and ground to make a dressing which is mildly antiseptic.

A report to the American College of Physical Therapy describes a nerve-crushing operation used in the latter stages of poliomyelitis. The results are encouraging—the theory being that the nerve fibers when injured generate new nerve filaments which grow into the weakened muscle and stimulate it to new life and vigor.

Bacterial Plate Count of Milk

In determining the bacterial plate count of milk, "Standard Methods for the Examination of Dairy Products" requires that the plating shall be completed, i.e., dilutions made, plates pipetted, and the media poured, within an interval not exceeding twenty minutes after the first transfer is made from the sample.

According to a report of the Council on Foods and Nutrition of the American Medical Association, "When margarine is fortified with vitamin A (at least 9,000 U.S.P. units per pound) the investigations that have been made lead to the conclusion that it can be substituted for butter in the ordinary diet without any nutritional disadvantage."

Industry Leads in Research

Before the first World War most of the scientific research in this country was done in university laboratories. By 1920, 297 American companies had research laboratories of their own, employing 7,400 scientists. By 1927, the numbers had grown to 1,000 laboratories with 19,000 on the staffs. In 1931, there were 1520 industrial laboratories staffed by 33,000 and in 1940, 2,350 companies had laboratories manned by 70,000 researchers.—*Sci. N. L.*

A Jap war dog, captured by the Third Marine Division, being operated on by 1st Lieut. William W. Putney, USMC, of Farmville, Va., veterinarian of a Marine devildog contingent fighting on Guam. A .45 calibre slug was removed from the dog's jaw and the dog is now recovering fast. A red German shepherd, the Jap war dog would not respond to commands in English, Spanish or Chamorro but when a Marine officer who spoke Japanese commanded him he obeyed instantly. Natives told the Marines the Japs had six matched red German shepherds on Guam and trained them on the Plaza. The Marines call the dog "Tojo" and will try to train and use him against his former masters. Assisting Lieut. Putney is Pfc. Ray Tomaszewski, USMC, 1310 West 20th Street, Lorain, Ohio.

U. S. Marine Corps Photo

Soldier Fatality Rates from Disease

Disease	World War I	World War II
Meningitis	38%	4%
Pneumonia	28%	0.7%
Tuberculosis	17.3%	1.8%
Dysentary	1.6%	0.05%

Annual death rate (excluding injuries) per 1000: World War I, 14.1, World War II, 0.6. Thus among a group of 100,000 troops there were 1410 deaths from disease in World War I and in the present war there have been 60 —a saving of 1350 lives for every 100,000, or 101,250 per year in our army of 7,500,000.

Anthrax in India

The most recent annual report on animal plagues in India, in which country many U. S. Army Veterinary Corps officers are now located, shows the reported loss from anthrax to total of 5,779 cattle and 65,889 cattle vaccinated for the prevention of the disease. Rinderpest, captain of animal plagues, was responsible for the death of 43,790 cattle and 2,291,933 prophylactic vaccinations. The use of goat virus vaccine increased during the year. Blackleg caused more than 11,000 deaths in cattle and foot-and-mouth disease, even with a low mortality, caused 2,831 deaths among cattle. Hemorrhagic septicemia is charged with the loss of 12,790 cattle notwithstanding the prophylactic vaccination of 638,252 animals against this disease.

Encephalomyelitis Cases Number 4312

The report of Dr. A. W. Miller, chief of the B.A.I. on the number of cases of equine encephalomyelitis reported to September 29, showed an increase of 3007 cases over the number given August 19, the date of the last preceding report, or a total of 4312 cases since January 1, 1944.

Four adjoining states, Iowa (721), Nebraska (712), Minnesota (402) and Kansas (208) make up more than two-thirds of the increase for the whole country.

Of the total number of cases to September 29, seven states, Nebraska with 997 has reported the greatest number and Iowa with 860, Minnesota with 533, Missouri with 284, Kansas with 264, South Dakota with 231 and Colorado with 209 cases account for more than four-fifths of the whole number.

Contrary to expectations, instead of subsiding during October as has been the case heretofore in outbreaks of encephalomyelitis, 5504 new cases were reported from September 29th to October 28th. Nearly all the new cases were reported from eight states: Missouri 1292 new cases, Oklahoma 697, Iowa 692, Kansas 646, Illinois 588, Minnesota 484, Nebraska 436 and Texas 192. In the total number of cases from January 1st to October 28th Missouri lead with 1576 cases followed by Iowa, 1552 cases, Nebraska, 1433 cases and Minnesota with 1017 cases.

War Dog Training*

Battle conditioning is an important and necessary part of the war dog training program conducted by the Quartermaster Corps. Their work, whether patrol, messenger, casualty, or other activity, is highly specialized; in order to perform their various missions, the dogs must become inured to all noises and distractions except those related to their duty or those which threaten to interfere with its completion.

The dog's introduction to battle noises begins with the firing of a gun at a distance while he is engaged in some activity which absorbs his attention. As he becomes accustomed to the sound, intermittent firing continues, gradually coming closer and closer.

All war dogs are vaccinated against rabies. Here Major Arthur H. Bryan and Staff Sergeant are giving his vaccine to "Butch"

Like a trained horse, a dog is "conditioned" to gunfire when it is possible to discharge small arms directly over him without his flinching.

Then he is ready for the combat course. In company with others, he carries out orders and goes through training activity amid the rattle of small arms and machine gun fire while light artillery, up to 75 mm field pieces, booms away at a distance. Mines on the field explode all about the dogs, giving the effect of bursting shells.

War dogs are trained at five War Dog Reception and Training Centers conducted by the Quartermaster Corps, which trains all dogs used by the Army, Navy and Coast Guard. Normally, a dog completes his training in from eight weeks, for sentry duty, to thirteen weeks, for the other categories—messenger, attack, casualty, scout, and sledge and pack duty.

The training program is divided into two

phases. There is basic training, which teaches the animals obedience, and the various commands which will be used by his handlers. The second and final phase is devoted to specialized training in the type of duty for which he appears best fitted.

The individual soldiers, sailors and coast guardsmen who are to work with the individual dogs on active duty conduct this final stage of the training, working under the supervision and direction of army trainers.

The Army is using dogs to locate the deadly

An attack dog

anti-personnel mines and booby traps set by the enemy, the War Department has revealed.

The dogs who do this dangerous work are known as M-Dogs. These canine specialists locate mine fields, lead the way around them or point a safe path through them when it is impractical or impossible to by-pass the mine field. They also indicate areas that are free of the death-dealing devices. As soon as M-

*All photos in this and the two following articles are official photos of the U. S. Army *Signal Corps.*

Dogs locate mines or booby traps, the explosive devices are either removed or deactivated and the cleared areas marked with tape.

The Quatermaster Corps developed this mine-detecting method and began training dogs for the work more than a year ago. Following the regular basic dog training, specialized training makes expert land-mine hunters out of the War Dogs. They are considered fully trained when they can carry out their mission over all kinds of terrain and in all sorts of weather. They have found and indicated to their masters the presence of mines that have been buried for weeks. They are especially proficient at indicating the presence of non-metallic mines, which are difficult to locate with mechanical detectors.

Sick call at a Virginia camp. The members of the Veterinary Detachment are, left to right: Pfc. Andrew Dewiler, Sgt. Edgar Rivkin, Cpl. Armond Keehn, Cpl. Carl Jurs, unidentified and Major Arthur H. Bryan, station veterinarian

The inherent ability of a dog to detect buried objects is developed to a high degree and he is taught to concentrate on discovering certain types of objects, to wit, concealed mines. These include both the metallic and non-metallic, trip wires, and booby traps. When completely trained, the dog cannot be induced to advance over any type mine or trap.

The M-Dog works on a six-foot leash. When he discovers the presence of a mine or booby trap, he signals his find to his handler when at a distance of one to four yards from the concealed device. Each animal, however, invariably alerts at approximately the same distance each time, enabling the handler quickly to find and mark the exact spot of concealment.

Dogs are chosen for this type of training according to qualifications, rather than breeds. Different breeds are utilized but the animals must be of medium size, weighing from 45 to 65 pounds, be high in intelligence, willing to work, of quiet nature and not easily distracted.

As in other dog units, M-Dogs train and work with the same soldier, the pair working as a unit since it is essential that each handler know his dog thoroughly and be able to "read" his every action. In the event a handler is replaced, about two weeks of indoctrination are required before the new pair becomes a capable working team.

Veterinarians Were First to Advocate the Use of Dogs by Our Army

After mention of the use of dogs in war throughout historical time and a discussion of the employment of these animals in the armies of our allies and of our enemies in World War I, the following paragraphs occur in "Veterinary Military History of the United States":

Captain Christain G. Jensen (left) and one of his St. Bernards

"Obviously, the use of dogs in the United States Army is a special service that should not be entirely lost sight of, inasmuch as their value as assistants to patrols and in liaison

work is unquestionably practical, inexpensive and probably indispensable under certain conditions. It seems reasonable to suggest that such a service operated under definite regula-

tions and maintained at a high rate of efficiency by training in simulated warfare should be more than amusing.

"The thought that naturally comes to mind is that a certain number of dogs could be raised at army posts, maintained by the personnel as a pleasure as much as a duty, and be ready for more serious occasions when emergencies arise."

The "Veterinary Military History" was published in 1935 and five years later the training and use of dogs for the first time in the United States Army was begun at Fort MacArthur, Calif., under the identical conditions recommended. In 1941 a canine command was organized using dogs belonging to the military personnel of the Post. Out of this beginning at Fort MacArthur, the K-9 Corps developed until now the armed forces possesses about 20,000 dogs and employs them in a wide variety of tasks both at home and overseas.

Unusual Fractures in a Dog

By TOM EVANS, Major, V.C.

History.—A black cocker male, three years of age, was presented to the Post Clinic for treatment. He was carrying the left foreleg as a result of an injury received in a fight with a larger dog.

Examination.—Pain and crepitation were present above the elbow, in the left foreleg. No displacement of the bones was apparent upon manual manipulation. Radiographs revealed a greenstick fracture on the medial

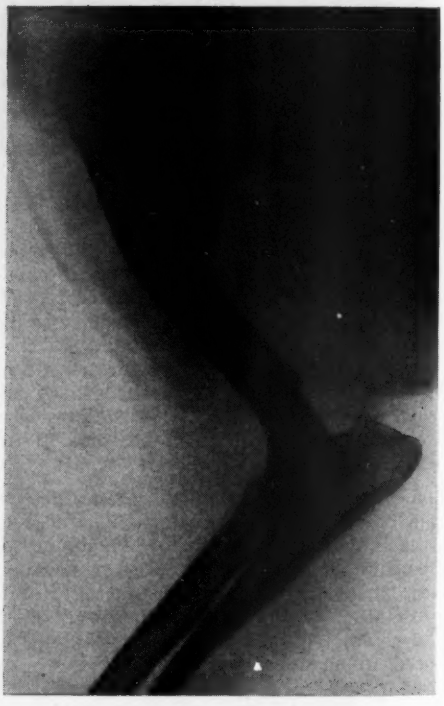


Fig. 1. Greenstick fracture

surface of the distal end of the left humerus (Fig. 1).

Treatment.—There being no displacement, reduction of the fracture was not required. Immobilization only was required. This was accomplished by a very lightweight cast, composed of hardware cloth, cotton, and bandage covered with sodium silicate and ordinary paper tape.

A week later, this patient was returned for the treatment of a new injury.

History.—This cocker had become so versatile in using the cast as a crutch that he had resumed his normal activities. His owner, upon

being beseeched, lifted him onto a bed, where he was ensconced in his former glory. In attempting to get down from the bed unaided, he became entangled, fell and injured the opposite foreleg.

Examination.—The right foreleg was very sensitive. Pain and swelling near the elbow were the predominating symptoms. Upon manual manipulation, only occasionally could crepitation be felt. There was no apparent displacement; however, a fracture involving the

Fig. 2. Fracture of the medial condyle of the humerus

humero-radio-ulnar articulation was suspected.

A radiograph was made, with the dog lying on his left side and the cassette held underneath the right elbow. This did not disclose a fracture, although the articular surfaces seemed to be separated more than would be considered normal. Since some crepitation could be heard and felt, a second radiograph was made from the anterior to the posterior surface through the elbow joint. The film, when developed, showed plainly a fracture of the medial condyle of the humerus (Fig. 2). This dog now presented a complicated problem—the left foreleg with a week old, greenstick fracture, and the right foreleg with a fracture of the medial condyle of the humerus.

Treatment.—There was no alternative but to remove the first cast, and construct a new one which would include both legs. The procedure was the same as that followed in making the previous cast, except that a cardboard box was made to fit from the breast to the toe just wide enough to act as a spacer between the legs (Fig. 3).

Ten days later the double cast was removed, and a new cast placed upon the right leg. The left leg being healed by this time, it was given no further treatment. However, while

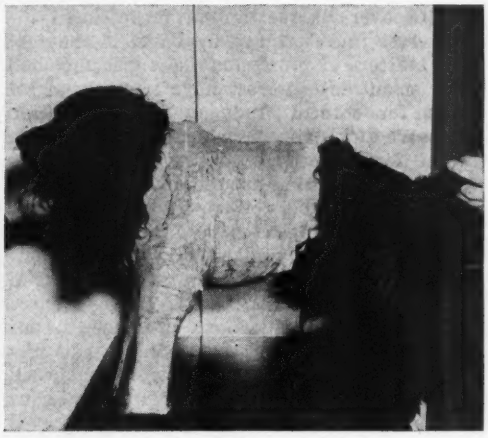


Fig. 3. Cocker Spaniel with a cast on both front legs

both front limbs were in the cast, the dog had learned to walk on his hind legs, and several days elapsed before he would use the left foreleg. One week later, the final cast was removed.

The animal is now using both forelegs without apparent limitation in his movements.

Sea Water for Mange

Twenty cases of sarcoptic mange and 30 cases of demodectic mange in dogs were treated in the research unit of the Madras Medical College[1] by parenteral injections of sterile sea water. All cases of sarcoptic mange recovered and all of the follicular variety but three in which the prognosis was particularly unfavorable, recovered.

The dose was 3 to 20cc according to the size of the dog and injections were equally effective whether made intravenously or intraperitoneally. The authors recommend a series of 20 daily injections. Most animals recovered after one series of injections. Stubborn cases of demodectic mange required two series of injections and an occasional case required three.

The authors postulate that the sea water injections may bring about a modification of the tissues or of metabolism that is unfavorable for the parasites.

[1] Venkatachalam, K., Ratnagiriswaran, A. N., Sastry, M. R. Subramania, Ramasway, R. and Nayar, C. K. Velayudhan. The parental administrtaion of sea water in the treatment of canine mange—sarcoptic and follicular. *Indian Vet. Sci. and An. Husb.*, and *Indian Vet. J.*, 21:1, 1944.

Matters of Professional and Scientific Interest in Veterinary Medicine*

By L. A. MERILLAT
Chicago, Illinois

THE over-all question of professional interest in veterinary medicine is the fact that matters of professional (as distinguished from scientific) interest have never been set apart for careful study in our association work. We tackle the trees but pay no attention to the forest, to the end that the profession as a unit is pushed around to the disadvantage of its members. Were I to convince you that every meeting of this organization should discuss fearlessly, "matters of professional interest," I shall conclude that the writing of this paper was worth while. There are too many professional questions untouched in our branch of medicine to even scratch the surface of the subject here. So, I have chosen several of the main issues of professional concern to touch upon briefly.

I. How Many?

How many competent veterinarians a country needs has been a controversial question since formal veterinary education was started in the 1760's, and the issue has survived to this hour. The question is basic and not trivial. It stirred up a rumpus in the cabinets of two French kings—Louis XV and Louis XVI—when the horseshoers (*la maréchalerie*), the predecessors of the veterinary college alumni, denounced the education of white-collar animal doctors by the Alfort faculty, and I think the tragic climax ought to be known to all veterinarians who have been graduated at a veterinary college. The controversy led to the arrest of Director Philibert Chalbert (1737-1814) and long imprisonment during the French Revolution for graduating men who were encroaching upon the alleged rights of the horseshoers of Paris. The records show that he escaped the guillotine on the grounds that he himself had been a horseshoer (*maréchal*) during the Seven Years War. During the same decade the regents of the University of Berlin made vehement protests to Frederick the Great for directing that a faculty of veterinary medicine be established in the University. The medical faculty denounced the idea of bringing veterinary students into their august atmosphere and, as the story is told, they raised the question of educating men who were to compete with the existing order. The first veterinary students of Berlin were ostracized by the rest of the student body.

These two examples are raised from the pages of veterinary history to show that the question of how many veterinarians a country needs is as old as the veterinary profession itself and that it has followed developments unchanged. But why go back to the eighteenth century? It was never hard to arouse protest against a system of formal veterinary education that would encroach upon the field of profitable quackery in animal medicine. I'll bet a dollar to a rancid doughnut that few agricultural historians could explain why this country developed a population of 120,000,000 and the largest animal industry in the world before taking over the responsibility of furnishing the American people with competent veterinarians. Who lived in the shadow of the guillotine here? It was always easier to frown upon graduating more veterinarians than to search for facts as to the need for them. I have heard practitioners of New York and Brooklyn growl at Liautard for turning out too many graduates, and in my own bailiwick, Chicago, the colleges were constantly charged with the ungodly sin of graduating more competitors.

That, my friends, is the narrow view the veterinary profession seems to have entertained without letup down to this day. If you are curious, you must have noted that there was a population of 50,000,000 and a vast animal industry before we had a corporal's guard of graduate, rural practitioners. Today our population is around 136,000,000 and the largest animal population in our history, yet many places are without a veterinary service and but a tiny percentage of the food we eat is guaranteed a reasonably good inspection from farm to kitchen.

In 1943, after making a survey of the veterinary situation of their country, the veterinary association of New Zealand reported to the Department of Agriculture that instead of 71 competent veterinarians, the Islands should have 1,000 to 1,200 to properly serve their people. That fact-finding committee urged that a veterinary school be established so that 15 to 16 replacements may be furnished annually. At the same ratio this would

*Address at the 31st Annual Meeting of the Eastern Iowa Veterinary Association, Cedar Rapids, Oct. 10 and 11, 1944.

mean that the American people should have, at least, 30,000 competent veterinarians deployed in practice, research, education, production of veterinary supplies, food inspection, extension service, state and federal regulation (supervision, quarantine, shipments, sales), zootechnics (breeds and breeding, animal nutrition, farm and ranch hygiene, veterinary entomology, artificial insemination) and miscellaneous pursuits (sports, recreation, fur farming, insurance), all of which make up an endless list of services yet to be filled by formally educated veterinarians. Any comprehensive study made of the veterinary situation reveals that competent veterinarians have hardly touched the surface of their total obligation to their country.

At the recent Chicago session of the A.V.M.A., Dr. E. C. Auchter, chief of the Agricultural Research Administration, emphasized the unexplored opportunities for veterinary science in this agricultural country of ours. And, this reminded me that in the role of editor of the *American Journal of Veterinary Research* which restricts material to original research work, a large percentage of the articles published are of "extra-veterinary" authorship, meaning that veterinarians have yet to fulfill their obligations in respect to the fundamental knowledge, which the livestock industry needs, but which it has to obtain from other branches of applied science. This is proof of a shortage of veterinarians in high places. You are also aware that in some of ours states the chief veterinarians are merely advisers to non-veterinary directors, despite the fact that competent directorship of livestock sanitary work involves the most profound knowledge of veterinary medicine. In my state, we succeeded in having the legislature pass an excellent law with ample appropriations for the control of bovine brucellosis but, in attempting to enforce the law, Chief Veterinarian Fidler found difficulty in obtaining sufficient personnel to carry out the task.

I have just received a block of photographs from the Signal Corps of the Army which depict the operations of the Army Veterinary Corps in far-flung parts of the world. The captions attached gives the names of the veterinary officers and technicians, the place if not censored, and the variety of service they render in the handling of military animals (horses, mules, asses, dogs, pigeons) and in safeguarding the many types of subsistence destined to the troops. These photographs show that there is a marked contrast in scope and kind between the complete veterinary service of the army and the incomplete work of the veterinary service in civilian life. One is impressed with these officers and men sorting damaged food of all kinds (onions, potatoes, vegetables, canned goods, meat) at ports of debarkation, in quartermaster depots, in cars and trucks and, at temporary dumps, for distribution to troops on the Rhine, in India, China, New Guinea, and on remote islands of the Pacific. An interesting picture among them is the veterinary supervision of an ice cream plant in England, and another of a veterinary officer checking the thermometer of a refrigerator truck when it arrived at the front in western Europe. These few examples should be sufficient to portray the difference between complete and incomplete veterinary service. As already mentioned there is much veterinary service needed between the feedlot and the kitchen stove, or let us say between the cooler in the packing house and the pantry of the housewife.

The other day I received a letter, from a retired inspector of the United States Bureau of Animal Industry, deploring the veterinary situation of Arkansas, where he has lived in retirement for two years. He remarked that in two counties stricken with an outbreak of equine encephalomyelitis, totally incompetent nongraduates were speeding from farm to farm vaccinating horses at a dollar a head and gathering, and I quote, "a roll of bills that would choke a horse," and asking no questions about the type of virus involved. "There are 60 counties in the state that have no competent veterinarians," he adds, and in manifestly critical vein asks "Why something is not done about it." Here is an example of a technically competent veterinarian more than 30 years in the service who, obviously, has never stopped to study the veterinary setup of his country. In my many years of association and editorial work, I have found that this sort of complaining, about the ailments of the veterinary profession, predominates. But, in no instance has insufficient personnel been incriminated as the cause. Rolls of folding money big enough to "choke horses" wouldn't be taken out of the pocketbooks of American farmers, if American farmers had helped to develop the right sort of veterinary service. From the War between the states, in the 1860's up to World War II of the 1940's, a tremendous livestock industry developed in the United States without a correspondingly vast veterinary service of the competent sort and yet, like the horseshoers of Paris in the eighteenth century, are still arguing about the number of competent veterinarians the

country needs, shying at competition and blinded to the undeveloped ground begging our attention. The sarcastic truth is that, instead of dining with the livestock industry as it grew in importance, we have been content to thrive on the crumbs that dropped around the table, all of the while doting on science and neglecting to solve the professional questions of which I write.

It should not be necessary to remind you, that paucity in numbers has left important positions to be filled by outsiders. If our own educational system does not provide personnel for essential fields, other branches will fill the gaps. Under the veterinary educational system available since the profession of this country was born, necessity has created positions far beyond the ken of men untrained in the basic sciences, who completed their professional studies in two, three, four or five years. The number who pursued graduate work to prepare for higher levels in research and education has been too few for the veterinary profession to remain master of its vested domain. Handicapped as the profession was through absence of public encouragement and support until American independence was 150 years old, the fact remains that the veterinary profession, neglected as it was, did not make categorical studies of the country's needs. I therefore admonish the young veterinarian: know thyself and the profession thou hast joined.

The American people cannot visualize the price they pay in the cost of food, clothing and health for failure of the states to control hog cholera, mastitis, pullorum disease, equine influenza, swine enteritis and parasites of young animals. They do not know the price they pay in health and happiness for the failure of the states to assure a wholesome meat and milk supply, to control rabies, bovine brucellosis and many other diseases and parasitisms communicable from animals to man.—*Veterinary Military History of United States.*

The remedy will not be easy. Nothing important is easy. Our profession in this country was really not born until 1934 when the A.V.M.A. became a federacy of 48 state associations and of the provinces of the Dominion of Canada. The trebling of membership in recent years is a sign of health. The job before you is to bring all matters of animal health under the wing and directive of veterinary science and this can be achieved only through intelligent discussion of professional questions through the instrumentality of a solidly organized profession on a nation-wide scope. Your task is tough, but the effort is worth while for it's the long pull, not the daily dollar, you really cash at the bank. I recall the foresight of D. M. Campbell, C. E. Cotton, C. A. Cary and others one might name who worked tirelessly for several decades to bring about the situation you may now enjoy. Nothing short of veterinary medicine for veterinarians will give the American people the type of veterinary service they need.

II. State or Socialized Medicine

It is hard to keep humor out of an essay on state or socialized veterinary medicine because such a movement has never existed, does not now exist, and is not within the visibility of the strongest mental telescope. Animals, being what they are, are not likely to go about taxing their herd mates to defray the expense of sickness and hospitalization. Since "There ain't no such animals," it seems a bit stupid to bring up the question before this pragmatic audience. I have no objection to raising the question in behalf of the medical profession, but we have too much to fuss about in our own corral to set up a straw man to shoot at and fool veterinarians into pulling chestnuts out of the other fellow's fire, generous as we ought to be, as citizens, to help our neighbors. I fear that some of us are a bit "balled up." Although much of our work is public service, that is the very antithesis of what I understand as socialized medicine. Briefly told, the veterinary service of the United States is made up of a 60-year-old bureau of animal industry and its state connections, accredited and independent practitioners in farm- and pet-animal practice, state extension and research men, the commercially employed, and miscelaneous members occupied hither and yon in minor pursuits. Yes, the farmers and ranchers have had a lot of free veterinary service at the expense of the public, but as Doctor Koen would say, it made that "safest place on earth to raise livestock." The pay off was the vanishing incidence of tuberculosis, tick fever, foot-and-mouth disease, and other major plagues. When I hear of veterinarians speaking of state medicine, I can't help wondering what they are driving at.

Nothing in veterinary history of our country is more true than that certain state veterinarians and bureau veterinarians did some mudslinging back in the nineteenth centry and that we still hear echoes of the conflict, here and there, now and again. Personal jealousy and that inborn devotion to states' rights were the roots of the trouble. If the state medicine issue is brought into the veterinary arena of the present as an excuse to criticize the federal service it is 40 years too late, since now the whole world agrees that the greatest achievements of all times in veterinary medicine stem from the research work of the United States Bureau of Animal Industry and the best jobs of livestock sanitary policing have been carried out under its directives. This I say without discounting the excellent spirit of cooperation the majority of state veterinarians have displayed in stamping out, and keeping out the more serious animal plagues. At the recent Chicago session of the A.V.M.A. I heard a state official growling about the federal bureau not going after the hog-cholera problem as it went after bovine tuberculosis and Texas fever; yet I know, that in his state and mine, any approach to the rich hog-cholera pie by the United States Bureau of Animal Industry, would be about as peaceful a job as taking a juicy bone from a hungry Bull Terrier. There are things about the veterinary service one can't broach and stay popular. But as I have passed the age of discretion, I catch myself saying things out loud that, perhaps, ought to be whispered in the underground.

III. The Home Treatment of Animals

The time has passed for veterinarians to turn somersaults over the home treatment of animals, based upon common sense and age-old custom. In our professional approach of this subject we ought to divide self-medication into *justified* and *not justified* with general welfare as the motive in both instances. Justified home treatment should be encouraged as much as the not justified kind should be denounced. The home medicine chest is here to stay and the best way out is to see to its proper use by teaching sound practices which includes elementary knowledge of diseases. The smallness of our profession and the bigness of its task cannot be laughed off as much as graduate veterinarians may desire to do so. There are vast herds far out of reach of veterinarians which make one wonder what to do while and if the veterinary profession is developing to the point of providing them with classical veterinary service. The issue is food production, not professional ethics. Federal and state services are reaching out to the far-away herd, but I fear that so far as the individual sick animal is concerned, teaching the caretakers the *proper* use of the medicine chest is not a major sin. The trouble is that some of the makers of livestock remedies are not keen about making a distinction between remote herds and nearby farm animals, as shown by boastful distribution of veterinary supplies at congested centers of population; that $100,000,000 drug trade American druggist is told to go after. There, my friends, is veterinary service working in reverse gear. It should be denounced as a fling at large scale quackery detrimental to national security and most assuredly to the present war effort. Deceiving druggists into believing that they can qualify as doctors of animals, with a stock of drugs and a few hours of sales talk, is damnable treatment to the veterinary officer or technician fighting in New Guinea, and it's about the worst trend the American people can afford to tolerate. It is audacious to meddle with serious diseases that require meticulous knowledge of medicine to handle with safety to the livestock industry and to the nation itself, not to mention the human health phase involved.

These constitute the problems organized veterinary medicine has to solve, and shall solve judging from the progress of the last 10 years, provided we develop plans for solving them. My optimism lies in phenomenal growth of the national association. In recent years it has instituted promotional programs and affiliations which are rapidly bringing a better understanding as well as a profound respect for veterinary medicine. This forecasts happier days ahead. It is my solemn obligation to pay tribute here to Deans Bergman and Brumley and Harry Jakeman, who seized veterinary science as a whole and lifted it to a higher level in contrast with the hit or miss effort of the long past, and I am not going to forget Cliff Carpenter who ingeniously aroused general interest in poultry medicine for the first time in my recollection. What I am trying to hail is that the veterinary profession is on the ascendency and will keep going upward if veterinarians, individually and collectively, will but take time out to study what they are, where they came from and where they are going. "Know thyself" is a mouthful. Your importance in world affairs is great and the greatness is being more generally comprehended. That is the long sought footing of the veterinary profession during my lifetime. I beseech you not to lose this foothold. It's a new heritage veterinarians have never previously enjoyed.

IV. Grammar

At your banquet last year the toastmaster* poked fun at me for having brought grammar into the veterinary agenda. So, I shall take the guarantee of free speech vouchsafed by the constitution to explain that in filling considerable white space with typewritten copy and editing tons of manuscript I observed in the line of duty that in that branch of learning veterinarians vary from good to bad and to make things worse, I am not even a fair literary critic. There seems to be three grades of grammarians in the veterinary profession: bad, careless, and not so bad. I could not help but notice the number of lead pencils worn out in getting copy ready for the printer, not to mention the large number of folios that had to be reconstructed and rewritten. So when the A.V.M.A. had to keep two journals on the way to the printer all the time with a small office force it became necessary to adopt a uniform style for intra-office guidance as well as to pass out to contributors. I want to assure that there was no intention to make a pedantic display of literary knowledge. It was merely an effort to uplift veterinary medicine along with the other promotional projects the Association was undertaking. We simply wanted to knock at the door of the scientific world with cleaner hands. As a famous poet said "With words we govern men," but more significant is that we can't rise above the level of our literary front. It's the sizzling brand of our judges. If you will compare literary values preceding the late 1930's with that of today you will be forced to admit that an improvement has come over American veterinary literature. The reason, I leave to your analysis. I can only repeat what has often been said: "Those who publish material for a learned profession have a great responsibility." By their work, the whole profession is judged.

V. Zootechnics

One of the flaws in the development of the veterinary profession in English-speaking countries is failing to have made animal husbandry (zootechnics) a major branch of the veterinary curriculum. In Great Britain, Canada and the United States that branch of knowledge was left to the agricultural colleges. The original objective of our occupation is connoted in its name. "Veterinary" means pertaining to beasts of burden. Yet, when the study of animals was taken over to England in 1793 and to Canada in 1862, and to the U. S. in 1875, with the view of educating men for a new profession, animal husbandry was left behind and veterinary medicine was started on an exclusively medical basis, the basis upon which it stands today in these countries. Economics was left out! To be admittedly impolite, our forefathers set out upon an everlasting program of aping human medicine. If a farmer of Continental Europe wants information on the use, care or production of domestic animals he goes forthwith to the veterinary faculty. Among English-speaking people, he goes to the agricultural college, where that branch of learning is taught and there he finds men of quality engaged in developing a field originally intended for the veterinary curriculum and, needless to add, abundantly provided with buildings, grounds, laboratories and personnel that would make quite a luxurious showing if attached to our veterinary educational setup. Consequently, at this late day we have no right to complain about the crops of a field we neglected to cultivate.

The strictly medical aspect of the veterinary profession is shown in the program of this meeting. Of the 6,096,799 farms in the United States, horse power only is used on 53% of them, both horse and tractor power on but 19%, while tractors alone are used on only 28% of the total farms under cultivation. These figures indicate that horses and mules are used on 72% of over 6,000,000 farms, not mentioning the $100,000,000 race horse industry, and the horses of other sports, recreation, and pleasure. Yet, here in this room is a gathering of veterinarians from the richest agricultural section of the country who in not having bothered to give the soliped a place on their program, confirm the innuendo that we are indeed more medical- than zootechnic-minded.

Matters of Scientific Interest

In ennumerating some of the more recent developments, remember that I am not parading in the garb of a clinician. I haven't practiced in 25 years. My role is that of a reporter; yours that of judge and jury.

I. Chemotherapy

Obviously, antibiotics and sulfa drugs rank first among the important medical discoveries since Pasteur. Because of their spectacular germicidal properties and multiple uses, they stand on a higher plane than Ehrlich's organic arsenicals which have but one use. Old 606, however, established the fact that a chemical can kill germs *in vivo* without killing *vita* itself. Back in the early days of microbe hunting, France and Germany got into a bloodless war. Pasteur contended that chemical germ killers are cell killers too. One of the first dissidents to that theory was Paul

*Cliff Carpenter.

Ehrlich, on the other side of the Rhine, who proved that the spirochete of syphilis is vulnerable to arsenic. Some 50 years later, across the English Channel, came the discovery that a harmless mold had germ-killing properties, then from Schickelgruber's domain came the sulfa drugs which again upset the Pasteurian doctrine. Now in 1944 as we meet here in Cedar Rapids we know that chemotherapy is not a forlorn hope but a brilliant reality. But to even up credits, one is obligated to state, that when Dubos of the Rockefeller Institute of Medical Research extracted a relatively harmless germicide from *Bacillus brevis,* he was following the thesis of Pasteur that soil contains microbicide properties. The mold *Penicillin notatum* gave us penicillin and related antibiotics, *Bacillus brevis,* tyrothricin and tyrocidin better known as gramicidin. The sulfa drugs, of which there are now a considerable number, one credits to the chemical industry of Germany. There is no time to even touch the surface of this new field, except to say that the sulfa drugs, locally and internally, have remarkable curative properties in many animal diseases, tyrothricin has given important results in chronic bovine mastitis, and penicillin has not been sufficiently used in veterinary medicine to venture opinions as to its value. L. A. Klein and coworkers at the University of Pennsylvania, however, report the curing of seven udder quarters infected with staphylococci, which seems favorable for that refractory type of the disease. An outstanding matter to heed is avoid allowing the remarkable properties of the sulfa drug to lead to careless surgical technic. They are not a substitute for Listerism., and they are not to be regarded as harmless as many now believe. Unfavorable reactions have been little studied in veterinary medicine. On that account one is contrained to pronounce these famous drugs still in the experimental stage in veterinary medicine.

For the most turgid pages of absurd therapeutic doctrines, one must turn to the chapter on vitamins, or perhaps, just turn on the radio. As doctors, we may be thankful to escape the vitamin peddlers of the cosmic ether, important as nutrition is in our field. The study of vitamins has developed along three distinctly separate lines, namely: (1) Important ones have been synthesized and made available in exact dosage; (2) The presence in kind and quality *in vivo* of some of the more essential ones can be measured, and (3) diagnostic syndromes of vitamin deficiencies are being clarified. But as our mutual friend Hastings has emphasized, the clinically visible vitamin deficiencies are the climax not the beginning of the trouble at hand.

Being too vast to touch upon here, the subject of vitamins would not have been presented in this paper but for the newly discussed fact that vitamins in doses far beyond nutritional needs are destined to be entered into the field of drug therapeutics. They must possess tremendous potentiality in view of their action in tiny doses. I, therefore, predict that soon we shall be studying the pharmacodynamics of vitamins in the sense we use that term in the study of drugs. Though in nutrition, vitamins are but trace catalysts, pharmacologists are now demonstrating that, in large doses, some of them have therapeutic actions that are entirely apart from their normal functions in nutrition. Vitamins A, C and D are already described in that category. As you know, vitamin A in large doses is being introduced as a cure for acetonemia in cows and pregnancy disease of ewes. Vitamin C has been found to have the complex diuretic action of salyrgan, a standard drug used in the treatment of Bright's disease and other dropsical conditions. The action is that of changing the osmotic pressure of the blood, plus stepping up urine excretion two to three times the normal amount. Another vitamin that can be listed as a drug is D in doses ranging from 45,000 to 110,000 International Units per kilogram of body weight per day. The action reported is that of shifting the plasma and lymph as determined by the hematocrit. The action of vitamins apart from their nutritional values promises to enlarge greatly the list of useful drugs.

Although the title of this paper suggests a review of "matters of scientific interest" I have found on second thought that recent advances in veterinary science are too numerous to touch upon in the time allotted by you for the reading of this paper. In preparing material for the *Veterinary Science Newsletter* on veterinary medicine in the United States which is distributed widely in foreign countries by the Office of War Information and for the Britannic Book of the Year for 1945, I have been amazed at the progress veterinary science has made under the depressing effect of the war. So, in lieu of fulfilling my task, I shall take the easier plan of advising that veterinarians take more time out than usual for reading, the best way I know to keep abreast of the times and not renege on yourself, your clients, your profession and your country. You men in practice run a whale of a laboratory where science has to go for the final test of its products and its methods.

The Veterinary Service of Uncle Sam's Army in Australia*

By LT. COL. STANLEY M. NEVIN
Veterinary Corps, United States Army

I SHALL attempt to set forth some observations made during about fifteen months' service in Australia, a huge country, in which the climate ranges from mildly temperate in the South to that of a tropical jungle in the North. The 7,000,000 people are mostly of English, Scotch, and Irish ancestry. The Australian soldier, tall, rangy, and rugged, can withstand tremendous hardships, as proved by his record in jungle fighting.

The Veterinary Service was organized and is administered by the Veterinarian, Office of the Surgeon, United States Army Service of Supply. Activities pertaining to the food inspection service are administered through the base section veterinarians, each of whom is responsible directly to the Veterinarian, S.O.S. Base section veterinarians have authority or responsibility concerning animals only in relation to forage inspection, construction and maintenance of veterinary station hospitals in their areas, and the embarkation or debarkation of animals through ports over

Veterinary sections are placed on duty at the remount depot while awaiting activation of units in Australia to which they have been assigned

which they have veterinary sanitary supervision. They handle no sick and wounded reports rendered by unit veterinarians situated within the base section area. These reports are rendered through veterinarians of higher tactical headquarters to the Veterinarian, S.O.S., who consolidates them for transmittal to The Surgeon General. Meat and dairy hygiene reports are consolidated by base section veterinarians and transmitted through the Veterinarian, S.O.S., along with personnel and other reports pertaining strictly to base section activities.

Service with Animals

Animals obtained in Australia are purchased, processed, and issued by the quartermaster remount depot which is set up as an independent organization and functions under direct control of G-4, S.O.S. Veterinary sections arriving in Australia are placed on duty at the remount depot while awaiting activation of units to which they are to be assigned.

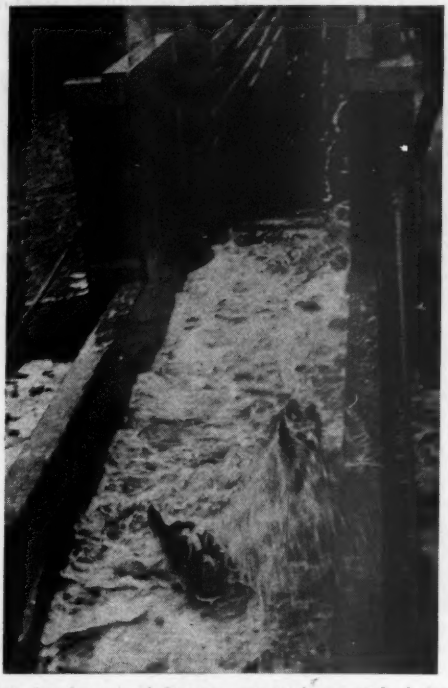
Glanders, infectious anemia, encephalomyelitis, and rabies are unknown in Australia and the health authorities see that they are not introduced. When we operate in tropical areas, parasitic diseases give the most trouble, but our veterinarians have kept them under control.

No long forage is fed except on farms. The so-called chaff consists of oaten, wheaten, or alfalfa hay, chopped into ⅛- to ¼-inch lengths and baled into 60-pound bales. The wheaten and oaten hays are permitted to grow to maturity instead of being cut in the milk or dough stage. The stalks are hard and yellow and the grain is ripe. In effect, this chaff is a mixture of grain and chopped straw. Much of the grain falls out in the process and is recovered to be fed separately. In the Australian Army they feed about one-fourth to one-third lucerne chaff to grain chaff, mixed. A moderate amount of grain is fed separately. In many units the animals are fed five times daily.

Many civilian animals, particularly draft horses, which are used in vast numbers, receive only the grain chaff with extra oats the year round and remain in excellent condition. The chaff ration is easy to transport, handle, or store, and it can be fed in the field without waste. In my opinion, the grain chaff would

*Condensed from *The Bulletin*, U. S. Army Medical Dept., 81, pp. 113-119 (October, 1944).

be improved by earlier cutting of the grain, especially since ripe grain is added to the ration. This would obviate the necessity of adding alfalfa chaff and thus further simplify another procurement problem. Our Army has wisely adopted both the Australian type of forage and the nosebag for feeding it in the field.



Only by the use of dipping vats is the control of ringworm practical in army animals

Food Inspection

All foods and forage were purchased through the Australian Army previous to 1943. The present procurement system provides for purchase by direct negotiation and contract, carried out in close cooperation with the director of Supply and Transport of the Australian Army, the Commonwealth Food Administration, price control authorities, and other government agencies. When contracts are let, base section veterinarians are supplied with copies of purchase orders and specifications and become responsible for inspection of all meat and dairy products purchased within their territories.

Since Australia owes its prosperity and development to its export industry, particularly animal products, the standards are high. The grading is extremely accurate and one seldom sees a product stamped out of its proper grade.

The Commonwealth of Australia Department of Commerce (C.A.D.C.) inspection is comparable to that of our Bureau of Animal Industry. One difference is, I gathered, that it has little responsibility for sanitation of premises, the latter coming under the supervision of the health department. Its inspectors are highly qualified and very cooperative. The chief inspectors and some assistants assigned to large abattoirs are regular five-year veterinary graduates; some abattoir assistants and those in charge of small bacon plants are graduates of two- or three-year courses at veterinary schools. In addition to these inspectors there are many so-called State Inspectors, whose qualifications vary. State inspection is not acceptable to our Army. In districts where C.A.D.C. inspection is unavailable, class 1 and 2 inspection is carried out by officers of our Corps. At many outlying points on the continent and in New Guinea, cattle and sheep are being slaughtered for troops by Australian Army field butchering companies. All inspection at those places is done by officers of our Corps.

Meat Packing

The municipal abattoirs and the large exporting plants are models of sanitation, are seldom more than two stories high, and cover a large space. Offal is carried away for processing at distant fertilizer plants. Australians go to great pains to beautify the grounds about the plants; however, the sanitation of some of the smaller bacon or sausage factories and provincial abattoirs, like that of some of our own, leaves much to be desired.

Beef. Herefords and Shorthorns seem to be the most popular breeds of cattle. They are fattened entirely on grass. Since Australians hold that cattle will not fatten well on grass before reaching maturity, they let them grow until they are five or six years old. Therefore, while the beef may be well fattened and of excellent conformation, it usually tends to be coarser and tougher than our grain-fed young beef. Also the carcasses have a coarse and lumpy appearance, as they do not follow our practice of shrouding.

Onchocerca gibsoni infests about 80 percent of beef cattle from central and northern territories. The nodules are found in briskets and stifle joints. Stifle joints are opened at inspection of all carcasses, and the briskets are entirely removed from forequarters exported to England.

Cattle shipped by rail are roughly handled. In the southern and central abattoirs, where cattle are received mainly by rail, our rejections on account of bruises were much higher than for any other reason.

Packing of frozen, boneless beef for our Army, under our own specifications, is done under supervision of officers of our Corps stationed at contracting plants. They work in close cooperation with C.A.D.C. officials, who frankfurters to our own specifications. A popular item in the northern trade is a highly seasoned, fresh beef sausage produced in the same manner as pork sausage.

Poultry. Poultry is not a popular food in

Onchocerciasis occurs in about 80% of the beef cattle from the northern and central sections. Nodules in the flanks, knees and shoulders, caused by *Onchocerca gibsoni* of the family *Filariidae*, are found on inspection

must place the Commonwealth stamp on each package accepted for export.

Lamb. Since Australia is essentially a wool-producing country and much of its export to the mother country calls for mutton, lamb is not as important in the local meat trade as is beef or cured pork. Our Army purchases some locally for use in camps and stations. The American soldier has let it be known far and wide that he does not like lamb; I think this is partly because earlier, when many of our troops were rationed by the Australian Army, they received a heavy diet of mutton which they thought was lamb. Many Australians have asked me if we eat lamb in America.

Pork. Fresh pork is not popular in Australia, but cured pork products are widely used. The Hampshire appears to be the most popular breed, with quite a number of Chester Whites, all bred to bacon type. They do not feed corn; but barley, the commonly used fattening grain, results in firm and fine-flavored meat.

Small goods. All edible by-products of the meat-packing industry, including organs and the various sausages, are called "small goods." We purchase these items only for local camps and stations. In some areas we had them make

Australia. Generally, the only type on the market in quantity is the fricassee hens, past egg-production value. Some turkeys are marketed and we have purchased considerable quantities.

Fish. Fresh fish are not plentiful because of war restriction on fishing craft; however, we were able to purchase a weekly issue for most of our troops on the continent. The commonest varieties available were red snapper, white perch, and sun fish.

Eggs. Egg production and marketing are under control of state egg boards. Grading is very accurate and no trouble was encountered in obtaining the grade required.

Canned meat products. The canning industry is in its infancy but is expanding rapidly. Varieties of meats and products containing meats are about the same as in this country, with the exception of chili con carne, which is not in demand in Australia. Products peculiar to Australia, such as "camp pie" are canned in great quantities. Many of the large canneries have most modern and efficient machinery and methods.

Australian canned corned beef is of high quality; however, because of grade surpluses at certain times, they have used too high

quality of beef. The result is a very rich product which contains too much intramuscular fat and does not "firm-up" well in the can at ordinary temperatures. All canned meat products being put up for our Army are inspected during manufacture by officers of the Veterinary Corps.

Fresh milk from tested animals is secured for troops at all times

Dairy Products

In the large cities are the most up-to-date dairy plants. Dairy sanitation in the provincial centers is generally only fair. Tuberculin-testing programs have been carried out from time to time by the Commonwealth and the state governments but have been somewhat curtailed during the war. They have nothing analogous to our accredited herd plan as a national program. Milk producers and butter and cheese producers have large cooperative associations throughout the country. Many associations have carried out 100 percent tuberculin and brucellosis testing. Fresh milk which has been tested is obtained for our troops in all cases. Milk for the large cities is collected by so-called cooling stations at points on transportation lines throughout the milkshed. There it is cooled to 40° F. and shipped in stainless steel tank cars to pasteurizing plants in the city. The various tests are made on the product of each producer at the cooling station, where an agent of the Milk Board remains on duty. Milk is again tested at the plant before and after pasteurization. Each state has its own milk board in addition to the municipal health boards of the cities.

Butter, being an export item, must conform to a high standard. The minimum standard is much higher than in our country. The cheapest back-alley "hash house" in Australia has no fresh butter scoring less than 90. They produce an excellent canned butter, but we found it did not stand up under field conditions in the tropics. Up to the time I left, we were using a fine grade of canned margarine which had excellent keeping qualities.

Cheese of good quality, similar to our Cheddar but lighter in color, is produced in great quantities and is a heavy item in the Australian Army ration. These cheeses are cured in Cheddars of 10, 25, and 50 pounds. We purchase only for troops on the continent. Defects found on inspection are about the same as those encountered in the United States, such as gassy, acid, rubbery, crumbly. Edam, Gorgonzola, and some processed cheeses of fair quality are found on the market.

Two by-products of the dairy industry, namely, cottage cheese and buttermilk, are not trade items. Buttermilk is not used as a beverage in Australia. A small amount of cottage cheese is made locally in restaurants and delicatessens. The quality is only fair.

Miscellaneous Notes

In a land where nature provides more formidable obstacles, logistical problems of other wars fade into insignificance by comparison. Supply at the battle of Buna was a feat that will live forever in the annals of military achievement. The veterinary officer played a part in that action just as surely as the fighting soldier whom he helped to feed. In a climate where boots mold overnight, where metal, unprotected by paint or lacquer, will rust through rapidly, where the moist heat of the steaming jungle penetrates all types of protective coverings, one can understand how only the constant vigilance of our inspectors could assure wholesome, unspoiled foods for men on the firing line.

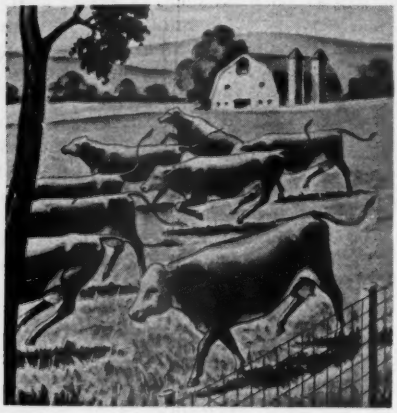
All cans containing food products must be thoroughly lacquered. Even one tiny spot left bare on any part of the can will rust through in a very short time. One "blower" in a stack will cause spoilage of many surrounding cans. Therefore it is essential to stack in a way to make all parts as available as possible, to carry out constant inspection, and to remove spoiled cans before they burst and contaminate others.

The field artillery pack, including animals, personnel, guns, and all equipment can be moved handily by air. Mules and horses travel well in cargo planes, cross-tied by twos in tandem.

The Phillips cargo-type packsaddle is unsuitable for smaller type pack horses. They cut their stifles on the lower rear corners.

Also it is too heavy when wet. The Australian Army packsaddle is more suitable for the smaller animals. It is practical to ship milk goats from Australia to New Guinea to provide fresh milk for hospitals. They can live on the country; cows cannot.

In handling cattle, no ropes are used. The cattle are driven with whips and trained cattle dogs. Branding and other work are done in pens on the cattle station. The stock saddles



The cattle are driven with whips and with trained cattle dogs

have no horn. They are built somewhat like our training saddle, except for a deeper seat and higher pommel and cantle. Projecting inward from the pommel are two leather-covered metal flanges, under which the rider's thighs fit. The horses are very handy, like our own cutting horses. They are better bred, containing more thoroughbred blood than our western stock horses.

The Australians are amazed at the high quality and variety of our field rations, particularly the jungle ration. After experience in France in the last war and again with an overseas army in this war, I am convinced that the American is the best-fed and best-equipped soldier in the world.

Conclusion

The veterinary service in Australia is efficiently organized and functions smoothly. Cooperation between the two armies and between our people and the civilians is excellent. The framework is laid for any amount of expansion. Any sudden increase in military activities in that part of the world will find the Veterinary Corps on the job and ready to go.

★★★ BUY WAR BONDS ★★★
AND HOLD THEM

Experiences of a Veterinary Officer

Service for many months with an Australian division including an operational period, was both instructive and, at times, amusing. The Australian sheepmen and cattlemen who usually managed the horses and mules were not without considerable knowledge of Veterinary lore. The ruling passion of their lives was Stockholm tar, which they use in their country for every conceivable condition. I was even told that a teaspoonful of Stockhlm tar was in infallible cure for canine distemper. This fact might explain the following message received from an outlying detachment:

"Horse injured; send some Stockholm tar; if not come yourself."

On another occasion, a detachment had been rebuked for not having made provision for its animals against the coming inclement weather. Two days later their animals were comfortably housed in a complete and properly built stable. On the way home, several miles down the road, I met an enraged mule transport company commander who explained that in the night one of his new stables had completely disappeared. Capt. D. W. Jolly, R.A.V.C. in *The Journal of the Royal Army Veterinary Corps.*

Milk and Human Health

Perhaps the most important vital chemical that is apt to be lacking in the American diet is calcium. It indeed seems strange that what we have in sufficient abundance to build our houses and pave our roads should be commonly lacking in adequate amounts in our food. Nevertheless, and in spite of the ease and cheapness with which this deficiency could be remedied, scientific work has established unequivocally that a lack of calcium is one of our most important "hidden hungers," and that this element is the one which is perhaps most often lacking in adequate amounts in the average diet. This fact has been borne out by experiments with succeeding generations of rats. When all other dietary factors are the same, the mere addition of calcium to the diet, above that ordinarily considered adequate for growth and reproduction, has resulted in faster growth, earlier maturity, larger and healthier litters, a longer span of reproductive life, and, finally, a longer total life. Again in terms of the average diet, the surest and most feasible remedy for this suboptimal calcium intake is through the incorporation of a larger portion of milk in the diet. —J. M. Sherman, Cornell University, in *Certified Milk.*

Veterinary Reports on the Use of Sulfanilamide Against Anthrax in Cattle and Horses

By R. B. WILCOX
Port Arthur, Texas

THE summer of 1944 there was an outbreak of anthrax in Port Arthur, Texas, approaching the epidemic stage, since several animals had died before a veterinarian was called in, the malady recognized and precautionary measures taken. The first animals to die, died quickly but as the outbreak progressed, the affected animals began to live for a day or two after symptoms developed. Some of these we attempted to treat. Having had no benefit from the use of serum in previous years, we decided to try sulfanilamide.[1]

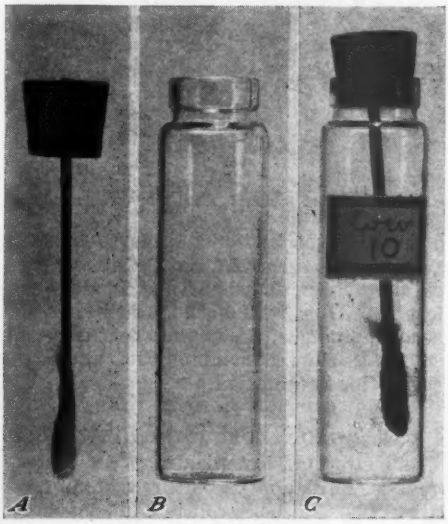


Fig. 1. One of the most satisfactory and safest methods of collection of blood of suspected cases of anthrax is the use of a sterile swab (A) attached to a cork of a sterile vial (B). With cork securely placed (C) and packed carefully it can be safely sent to a laboratory for examination[2]

There follows a record of five cases, four cows and one horse so treated. All five animals recovered.

Case 1.—A mature gelding had a temperature of 106.5° F. when we first visited the animal. The cervical and prescapular lymph glands were visibly enlarged and were very painful to the touch. The animal was very depressed and had refused food a few hours before we were summoned. A diagnosis of anthrax was made and the animal was given 200cc anti-anthrax serum, intravenously. In 24 hours, the temperature was 105.5° F. and there was no visible improvement in the animal's condition. In fact, he seemed to have grown noticeably weaker and reeled when forced to move. Sulfanilamide was given at the rate of one grain per pound body weight in two doses daily. Within 24 hours the temperature had dropped to 102° F. and the animal seemed greatly improved, even having eaten a small amount of feed. The same dosage of sulfanilamide was given for the next two days and then the dosage was reduced one-half for the following two days. Improvement was rapid and the animal was normal within a week after the first symptoms were noticed.

Case 2.—Several animals had died before we were called to see two cows that had sickened the day before. When we arrived, one of the cows was dead and the other was markedly depressed. Examination revealed the prescapular glands extremely enlarged and painful. The temperature was 107.4° F. A diagnosis of anthrax was made and the animal was

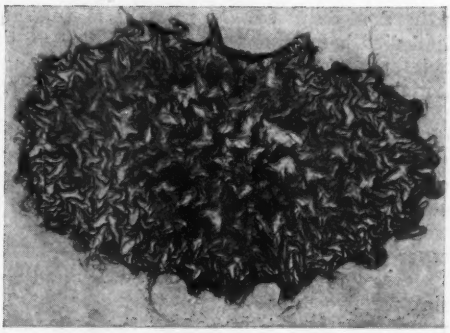


Fig. 2. Culture of anthrax colony removed from agar plate, fixed, mounted and stained lightly with Giemsa, showing arrangement of bacterial filaments throughout the colony (X 30)[2]

[1] Sterne, H. (*South African Med. J.*, 16, pp. 121-124, 1942) reported limited success in the treatment with sulfapyridine of virulent anthrax in sheep and rabbits.

[2] Stein, C. D. Studies and observations on the laboratory diagnosis of anthrax. *Vet. Med.*, 38:4, pp. 130-139, 1943.

given sulfanilamide at the same rate as case one. The next day the cow had a temperature of 104.3° F. and had taken a little feed during the night. Twenty-four hours later the temperature was normal and the cow was eating fairly well. The dosage of sulfanilamide was reduced by one-half for the next three days at which time the animal was normal and on full feed.

Case 3.—The patient was a Jersey—one of a herd of dairy cows. Two bulls in this herd had died before we were called. This cow had a temperature of 106° F. and the prescapular lymph glands were enlarged. Again the diagnosis was anthrax and the same treatment as outlined above was given. The animal improved rapidly although the prescapular glands increased in size considerably. These swellings soon subsided, however, and when we saw the cow recently she had fully recovered.

Cases 4 and 5.—A grade Jersey cow had been sick for two days before we were called. The symptoms were identical to those described in the preceding cases and a diagnosis of anthrax was made. On sulfanilamide the cow recovered although she aborted a calf three days after treatment was started and a comparative slow recovery was attributed to the abortion rather than to anthrax, as her temperature was normal a day after she lost the calf. The same owner had a bull to sicken two days later and the symptoms of anthrax were observed. The treatment was duplicated and the animal made an uneventful recovery.

In all these affected herds, the sick animals were treated with sulfanilamide and the remainder of the animals were vaccinated with a No. 3 spore intradermal vaccine, regardless of previous vaccinations. It may be mentioned that in every case the owners previously had vaccinated their cattle with vaccine purchased locally. After vaccination with the intradermal products, no further deaths occurred. One case showed symptoms of anthrax two days after vaccination.

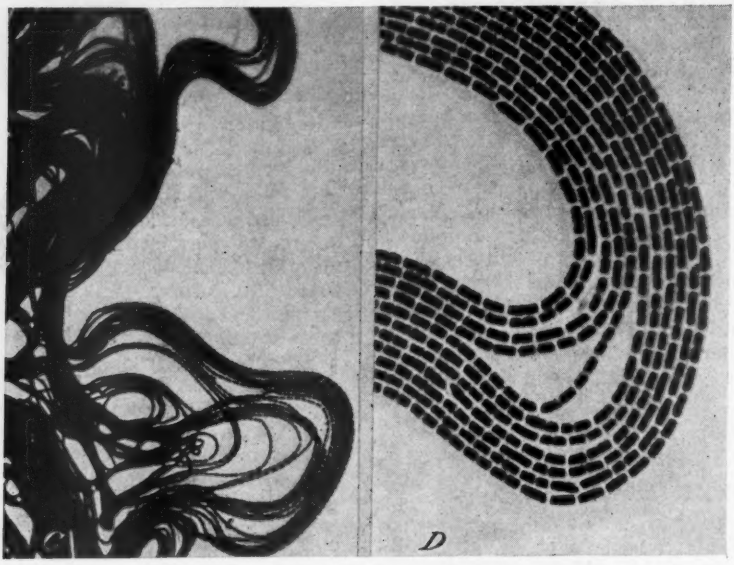


Fig. 3. Photomicrographs of an anthrax colony stained with methylene blue. *C.* Margin of a colony of anthrax. (X 400). *D.* Upper loop of *C* highly magnified to show the arrangement of the individual bacteria composing the long chains (X 1600)

Ascoli Test for Anthrax

Palmeiro in investigating (in Portugal) methods of diagnosing anthrax, obtained positive actions to the Ascoli test in some cases in which anthracoid organisms alone were concerned and concludes the test should be supplemented by isolations of the organisms and their identification.

Anthrax in Geese

Five Barbary geese which had access to blood from a bovine carcass dead of anthrax all contracted the disease and died, according to *Clin. Vet.* The lesions included tarry, unclotted blood, swollen spleen, pericarditis and congestion of the intestine, kidneys and liver. The diagnosis of anthrax was confirmed bacteriologically. This would seem to establish a greater anserine than gallinaceous susceptibility to *B. anthracis.*

Lead Arsenate an Effective Taeniacide for Domestic Ruminants

By R. D. RADELEFF
Kerrville, Texas

TAENIASIS of sheep, goats and cattle has long been recognized. Authors include the tapeworms in discussions of intestinal parasites of ruminants, but few class them as of real economic importance.

My practice includes a large portion of the sheep and goat country of Texas, just at the edge of and including a large portion of the Edwards Plateau district. It is in this territory that severe damage has resulted from tapeworms, particularly in lambs, kids, and calves.

The species most often found are *Moniezia expansa* and *M. benedeni*. *Thysanosoma actinoides* is seen frequently but infestations are usually mild and unimportant.

The moniezias are located in the small intestine. They may attain a length of 30 to 40 feet or more. The intermediate host of *M. expansa* is a free-living mite, which is found on the grass in pastures. Diagnosis of taeniasis may be made by finding single segments or strings of segments passed in the feces or by finding the characteristic microscopic eggs in salt flotations.

The losses from tapeworm infestations in the Edwards Plateau region occur during the fall, winter, and spring months. The mortality may range as high as 50% in herds of kids and calves and 25% in lambs.

The presence of the tapeworms causes irritation, enteritis, and masses of the worms may cause stoppage of the bowel. Probably the absorption of food by the worms causes greatest damage. The large quantity of waste products eliminated by the worms may be absorbed by the host and cause intoxication. The most characteristic symptoms are progressive unthriftiness and emaciation in spite of a voracious appetite. Other symptoms are rough coats, anemia followed by edema, potbellies and stunting of growth. The autopsy usually reveals an emaciated carcass with pale mucous membranes. The abdomen is distended and ascites is common.

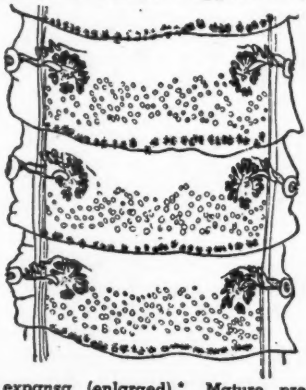
Treatment for this condition has been ineffective for the most part, using the older taeniacides such as aspidium, areca nut, arecoline, turpentine, pepo, and copper sulfate-nicotine sulfate. All will shear or remove some of the worms but none are very effective.

In 1941 McCulloch and McCoy[1] reported on the use of lead arsenate as a taeniacide in lambs, having recorded excellent results on some 555 lambs. The writer has tried this treatment with satisfactory results.

The first trial was made on a flock of 125 kids, all that remained of an approximate 250 live births. These kids were of varying ages from seven months down to three months. Presence of *M. expansa* in the flock was determined by autopsy examination. All kids in the group were emaciated with pale mucous membranes and kempy hair. Doses of 0.5 gram of lead arsenate were prepared by packing hard gelatin capsules with the drug and weighing accurately. One capsule per kid was administered orally without previous or subsequent fasting.

Two weak kids succumbed in a few hours. They were unable to stand at the time of treatment. In 24 hours the remaining kids began to pass soft feces and long strings of tapeworm segments. A few colicky symptoms were seen, but none of the kids were more than slightly uncomfortable.

Improvement was not apparent until the end of one week, after which steady gain was evident. Two animals were treated a second time after two weeks. At the end of one month neither the owner nor I could believe that we were working with the same flock of kids; they had gained weight, begun to play, and were much improved in general condition. No further losses were experienced.



Moniezia expansa (enlarged).* Mature proglottis of each segment has two sets of genital organs; the testes are distributed throughout the central field and the two uteri are reticular. *M. benedeni* segments are broader

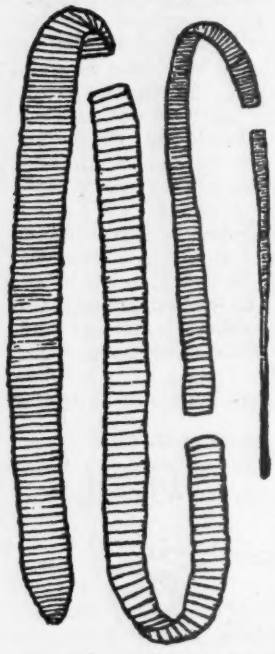
Additional trials of the taeniacide, identical

[1] McCulloch, Ernest C., and McCoy, John E.: Treatment of Ovine Taeniasis with Lead Arsenate. *J. A. V. M. A.*, 99, pp. 496-497, 1941.

* Illustration from *Parasitology* by Hegner, Root, Augustine and Huff. Courtesy D. Appleton-Century Company, Inc.

for the most part with the foregoing, are tabulated for the sake of condensation (Table I).

On a large dairy farm much difficulty was being experienced in raising Jersey calves in spite of adequate husbandry methods. The trouble had been variously attributed to calf pneumonia, white scours and a miscellany of other conditions. Necrospies revealed that infestation with *M. expansa* was the primary agent, leading to enteritis and pneumonia. The owner agreed to let me try the lead arsenate treatment. Since no data on dosages for calves were available it was decided that



M. Expansa (after Railliet). Natural size portions of the adult. Ripe segments found in the feces are whitish to yellowish in color and they resemble cooked rice grains

0.5gm doses would be given calves up to three months of age and 1.0gm doses would be given to those three to six months of age. An initial group of 19 was treated in the same manner as the goats—orally without fasting before or after treatment. Here the results differed—colicky symptoms of severe character developed. Doses of castor oil relieved the condition and dislodged the impacted masses of tapeworm segments. All calves passed quantities of segments for 48 hours. One calf passed, by actual measurement, 75 feet of segments and another exceeded a hundred feet. Improvement followed the trend described for the kids, although no re-treatment was necessary at the time.

Six months later it was apparent that seven animals required another treatment. This was given and no further difficulty was experienced. A routine practice was set up of treating the calves in the herd every four months. During the ensuing 12 month period only two calves died. These died from causes other than taeniasis. This herd that previously experienced an annual loss of approximately 50%. In all later wormings castor oil was given

TABLE I. SUMMARY OF THE RESULTS OF THE USE OF LEAD ARSENATE AS A TAENIACIDE IN THE DOMESTIC RUMINANTS*

Ranch No.	Animal	No. Treated	Dosage	No. Re-treated
1	Goat kids	125	0.5gm	2
2	Jersey calves	19	0.5 & 1.0gm	0
3	Lambs	88	0.5gm	3
4	Hereford calves	9	1.0gm	0
5	Goat kids	386	0.5gm	4
6	Jersey calves	26	0.5 & 1.0gm	1
2	Jersey calves	21	0.5 & 1.0gm	1
7	Goat kids	537	0.5gm	9
8	Lambs	420	0.5gm	10
9	Hereford cows	2	2.0gm	0
10	Jersey cows	2	2.0gm	0
4	Hereford calves	18	1.0gm	0
11	Lambs	650	0.5gm	10
12	Goat kids	786	0.5gm	15
13	Hereford calves	38	1.0gm	3
14	Goat kids	238	0.5gm-	12
	TOTALS	3365		68

*A total of more than eight thousand animals have been treated with this drug but somewhat less than half these are recorded here due to the fact that an accurate follow-up could not be made on the remainder.

one hour following administration of the capsule. No colic was observed and all calves had free bowel movements. Doses of oil were calculated according to the size of the animal as though no other medicament had been given.

Some fifty head of adult cattle, both Jersey and Hereford, have been successfully treated.

Initial trials on lambs were so parallel in similarity to those with kids that further description would only be repetition.

The lead arsenate used was a commercial, spray grade, 98% pure lead arsenate, which can be had at a low cost per animal treated.

Summary

Lead arsenate was used in the treatment of 1158 lambs, 2072 kids, 131 calves, and four adult cattle for the removal of *Moniezia* tapeworms with excellent results. No fatalities were caused by the drug and no ill effects other than colic were observed.

Conclusions

1. Lead arsenate, spray grade, is an effective taeniacide for the domestic ruminant.

2. Castor oil should follow the administration of lead arsenate to calves.

3. Lead arsenate, if properly used, is a safe, effective and economical taeniacide for calves, kids and lambs and is easy to administer.

Comparison of the Agglutinability of Several Brucella* Antigens (Rapid Test)

By GEORGE R. BENNETT**
East Lansing, Michigan

DUE to the many recent controversies concerning the accuracy of certain commercial antigens employed in the rapid agglutination test for bovine brucellosis, the author has obtained and tested samples of all antigens offered for sale. The antigens were tested against the rapid and tube antigens employed in the brucella laboratory at Michigan State College.

Blood serum samples were obtained from cattle and the titers determined by means of the tube method. Serums of different titers were then examined against each of the commercial antigens.

The agglutination tests were read three minutes and 10 minutes after mixing the blood serum and antigen. In order to prevent excessive evaporation of the samples after mixing, and to obtain a more accurate reading at the 10 minute interval, a small glass enclosure was placed over the mixing plate. Excessive evaporation of the mixture often confuses the reading of the test after three to five minutes.

The results of the comparative tests are set forth in the table. The antigens are designated by Nos. 1, 2, 3, etc. An additional serum, not included in the table, which showed a complete reaction in all the five amounts used in the tube test, also gave the same results with all rapid antigens with the exception of No. 4. The reaction with this antigen was incomplete with the smallest amount of serum at the end of three minutes, but complete at the end of 10 minutes.

In summarizing, it was found that all rapid antigens of the lots examined gave satisfactory results when used according to the directions of the manufacturer.

TABLE.—COMPARISON OF AGGLUTINABILITY OF DIFFERENT BRUCELLA RAPID ANTIGENS.

Antigen	Dropper gauge (c)	Reading time	Serum sample No. (1) Amounts in cc 0.08	(1) 0.04	(1) 0.02	(1) 0.01	(2) 0.08	(2) 0.04	(2) 0.02	(2) 0.01	(2) 0.005	(3) 0.08	(3) 0.04	(3) 0.02	(3) 0.01	(3) 0.005	(4) 0.08	(4) 0.04	(4) 0.02	(4) 0.01	(4) 0.005
1.	15	3 min.	T	-	-	-	+	P	T	-	-	+	+	P	-	-	+	+	+	P	-
		10 min.	T	-	-	-	+	P	T	-	-	+	+	P	T	-	+	+	+	P	-
2.	16	3 min.	T	T	-	-	+	+	P	T	-	+	+	+	P	-	+	+	+	+	P
		10 min.	T	T	-	-	+	+	P	T	-	+	+	+	P	-	+	+	+	+	P
3.	13	3 min.	T	-	-	-	+	P	T	-	-	+	+	P	-	-	+	+	+	+	-
		10 min.	T	-	-	-	+	P	T	-	-	+	+	P	-	-	+	+	+	+	-
4.	13	3 min.	T	-	-	-	+	P	P	-	-	+	+	+	-	-	+	+	+	+	-
		10 min.	T	-	-	-	+	P	P	-	-	+	+	+	T	-	+	+	+	+	T
5.	15	3 min.	T	-	-	-	+	P	T	-	-	+	+	P	-	-	+	+	+	T	-
		10 min.	T	-	-	-	+	P	T	-	-	+	+	P	P	-	+	+	+	P	-
6.	13	3 min.	T	-	-	-	+	+	P	T	-	+	+	P	T	-	+	+	+	T	-
		10 min.	T	-	-	-	+	+	P	T	-	+	+	P	T	-	+	+	+	T	-
7.	15	3 min.	T	T	-	-	+	+	P	T	-	+	+	+	P	-	+	+	+	+	P
		10 min.	T	T	-	-	+	+	P	T	-	+	+	+	P	-	+	+	+	+	P
8.	15	3 min.	T	-	-	-	+	+	P	-	-	+	+	P	-	-	+	+	+	P	T
		10 min.	T	-	-	-	+	+	P	T	-	+	+	P	T	-	+	+	+	P	T
9. (a)	15	3 min.	T	-	-	-	+	P	T	-	-	+	+	P	T	-	+	+	+	P	T
		10 min.	T	-	-	-	+	P	T	-	-	+	+	P	T	-	+	+	+	P	T
10. (b)		48 hrs.	-	-	-	-	+	P	-	-	-	+	+	P	-	-	+	+	+	P	-

*Journal article No. 525 n.s. from the Bacteriological Section of the Michigan Agricultural Experiment Station.
**Central Brucella Station, Michigan State College.

Clinical Reports

Lateral Hermaphroditism (Gynandromorphism) in a Pig

The anatomical manifestations of gynandromorphism, including those of both the internal and external genitalia, are evidently due to some heritable disturbance of the mechanics which govern the normal differentiation of sexes.

The malformations of intersexuality constitute a gradual series of combinations of variations between complete and abortive development of the derivatives of the Müllerian and Wolffian ducts. These cases have been classified largely in adherence to reports of cases. In true hermaphrodites, when male and female gonads are present on both sides of the body, the condition is called bilateral hermaphroditism. When gonads of both sexes

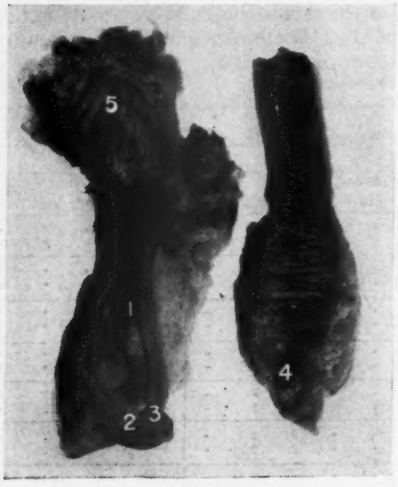


FIG. 1. EXTERNAL GENITALIA
1. Labia. 2. Clitoris. 3. Urethral opening. 4. Prepuse and 5. Anus

are present only on one side, the opposite side being one-sexed, the condition is called unilateral hermaphroditism. When there is a male gonad on one side and a female gonad on the other, the condition is termed lateral hermaphroditism, or gynandromorphism.

The most widely accepted hypothesis on the occurrence of intersexes is that advanced by Crew,[1] who starts with the premise that in embryos, up to a certain stage, male and female are alike and that the genital primordia requires stimulation or inhibition at a certain critical and definite time in the course of their differentiation in order that normal male and female organs may be formed. He believes that male and female hormones, elaborated by specific interstitial cells of the gonads, perform this task. The male hormone instigates the development of the Wolffian

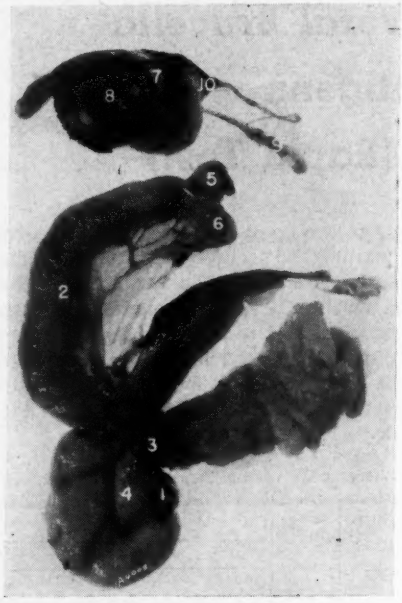


FIG. 2. INTERNAL GENITALIA
1. Ovary, 2. Uterine horn, 3. Left inguinal ring, 4. Broad ligament, 5. Stump of right uterine horn, 6. Stump of uterus, 7. Right inguinal ring, 8. Testicle, 9. Spermatic vessels and nerve and 10. Ductus deferens

duct, and the female that of the Müllerian ducts, and general epithelium is stimulated to form testes in one sex and ovaries in the other; intersexuality being due to the retardation in the production of such stimuli, or an insufficient amount or impairment of the quality of them. However, in the case of gynandromorphism, the question of why one gonad did not suppress the other during autogamy is still controversial.

The following case was observed and specimen taken from a post-mortem examination of a swine carcass in a local abattoir. The subject was a hog of mixed breeding, age and parentage unknown. On the ante-mortem inspection of the animal nothing abnormal was noted. Autopsy notes follow: in the usual position were labia 3½ inches long. They consisted of fat and fascia only and had no connection with the body of the uterus, but terminated in the subcutaneous tissues. The clitoris was much exaggerated and on palpation a length of 1½ inches could be disclosed. The urethral opening was located on the dorsal surface. The prepuce resembled that of the normal male, however, there was no opening and only

[1] Crew, F. A. E., Abnormal sexuality in animals. *Quar. Rev. Biol.*, 1, pp. 315-359, 1926.

fat could be palpated in this region. The teats were small, resembling those of the male. There was no recognizable mammary tissue.

Upon opening the abdominal cavity, two gonads were found. The left was an ovary having a round flattened appearance, 1¾ by ½ inches. Its surface was smooth and presented several irregular prominences which appeared to be immature graffian follicles. This structure was attached to the broad ligament. The left uterine horn was 18½ inches long and was connected with the ovary by a fallopian tube. The right uterine horn was shorter and no fallopian tube or ovary was observed. Lying just outside the right inguinal canal was a modified testicle 3¼ by 2 inches. Its surface was smooth. The epididymis was small. Arteries, veins, and nerves joined the epididymis and supplied the gonad. The ductus deferens was degenerate and terminated in the abdominal fat.

The two uterine horns fused to form the body of the uterus which did not extend into a well defined cervix and vagina. This structure ended in the fat of the pelvic cavity. The modified uterus bore a normal relation to the bladder. The urethra was connected to the clitoris. The ischiocavernosus muscle attached the clitoris to the pubic arch.

CLYDE E. BROWN

Kankakee, Ill.

Deep Sinus in the Hip of a Mare

March 9, 1944, a two-year-old filly was presented for treatment of a discharge from an opening just in front of the left tuber coxae. The owner stated that the colt ran into an iron rod sticking out from a binder 18 months previously and the resulting wound closed up and the patient became lame in the left rear leg. Later it broke open and there was a large amount of discharge from it. This procedure was repeated every few months.

A putrid smelling pus was discharging from a fistulous tract about one foot deep that pointed downward and backwards.

A caustic solution consisting of absolute alcohol 6cc, chloroform 3cc, glacial acetic acid 1cc, and ferric chloride 1gm was injected every other day until four treatment had been given, after which the discharge was of a greyish color and there was a slight decrease in amount. Then 1gm of red iodide of mercury suspended in 5cc of alcohol was injected with still no benefit. This was followed by 20cc of formaldehyde in a pint of water which was injected every other day for three times. The discharge disappeared, but soon reappeared.

March 31, an operation was performed in the left flank region. The patient was cast and rolled upon its back. While an assistant kept his hand in the rectum, the operator, with the guidance of the assistant, cut into the flank region in an attempt to find the bottom or pocket of the fistulous tract. This was located just slightly medial to the shaft of the ilium but still outside the peritoneum. The pocket was opened and drained of the pus. The wound was then flushed and packed with a chlorine solution three times at daily intervals.

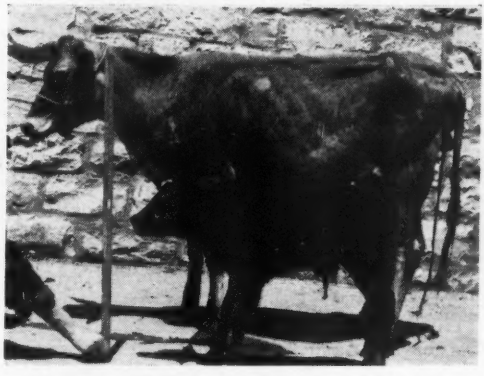
Although the original prognosis was a guarded one, complete recovery followed.

LAWRENCE A. HILL

Horton, Kans.

Normal Parturition in 343-Pound Heifer

A 16-month-old purebred, registered Jersey heifer was presented for treatment March 3, 1944. The heifer was unable to get to her feet in the morning and was brought to the clinic in the afternoon in a recumbent position. A rectal examination was made and she seemed apparently normal in all respects. A vaginal examination was made and the cervix found to be tightly constricted. Intravenous injections of 250cc each of 20% calcium gluconate and 25% dextrose solution were administered intravenously, whereupon the heifer got to her feet and showed no other distressing symptoms. At that time the heifer



was seven months pregnant. From the 3rd of March till the 12th of May she was kept under close observation. On the 12th of May she calved normally.

The interesting phase of this case was the small size of the heifer and the calf. The heifer was 36 inches tall and weighed 343 pounds. The bull calf weighed 33 pounds at birth, measured 20 inches in height, and 19 inches from the crown to the rump. The calf was a Jersey-Hereford cross due to accidental mating by a 1000-pound Hereford bull. The calf was full term and in excellent condition.

ALLEN SHOPMAKER

Kansas City, Mo.

Acute Mastitis in a Sow Due to Colon Bacilli

Although much research has been devoted to the causative organisms of bovine mastitis, very little literature may be found on porcine mastitis. In 1941 J. A. J. Venn reported in the *Veterinary Record*, 53 (1941), the occurrence of mastitis in a sow, terminating fatally and in which a coliform organism appeared to be the etiologic agent. It is thought that this type of mastitis is probably due to a blood infection, originating from the intestinal tract or, perhaps, in an open injury to the udder through which the organisms gain entrance. The latter seems particularly logical if the sow is kept under filthy conditions.

History.—August 21, 1944, a 300-pound, Duroc gilt was presented for treatment for dystocia. She had started labor 12 hours previously but had not delivered any pigs. She appeared to be in good condition, but was no longer in labor.

Five cubic centimeters of posterior pituitary extract was administered intramuscularly. The sow was then examined manually and a live fetus was felt at the entrance to the pelvic canal. The pelvis was roomy and everything felt normal, hence it seemed strange that the sow did not deliver her pigs. This fetus was easily removed by placing the first two fingers behind the ears and the thumb under the jaw, and by steadily and gently applying traction. The posterior pituitrin did not bring about contractions of the uterus and repeated injections, during the course of the day, also failed to bring on labor. During a period of six hours 11 live and one dead pig were delivered, only three of which were delivered by the sow without assistance. All the pigs were normal and husky. Nothing abnormal was noted about the mammary glands. After injecting about one-half pint of 10% sulfanilamide in oil into the uterus the sow was sent home.

Three days later this sow was returned for further treatment. She had suddenly developed a very acute case of mastitis involving all ten mammary glands. Her temperature was 104° F. and respiration was increased. The mammary glands were very hard and swollen and there was complete agalactia. The sow was very weak and would not eat.

Metritis commonly develops following dystocia, but no uterine involvement could be detected here. She was put on a course of sulfanilamide, one ounce per day in two doses. Also, twice a day, hot packs of saturated magnesium sulphate solution were applied to the mammary region for half-hour periods.

In an effort to determine what organism was the cause of the mastitis, an attempt was made, aseptically, to squeeze some material from the teat but only a drop or two of a reddish serous fluid was obtained. This was stained with Wright's stain and revealed numerous pus cells, many of which contained phagocytized, plump, rod-like organisms. Many of these organisms were also seen free in the exudate, as were many epithelial cells.

A sample of blood was drawn from the ear vein for cell count, hemoglobin determination and differential count. The blood was very dark, almost black in color (the reason for this is not known). The white cell count was 22,000 and the red cell count 4,000,000 (normal should run approximately 11,000 and 7,000,000, respectively). Hemoglobin was only 7.5, as compared to the normal of 11. On the differential count, there were found to be 18% segmenters, 30% stabs, 22% juveniles, 4% monocytes, 24% lymphocytes and 2% eosinophiles.

Drawing blood from ear vein for cell and differential count and hemoglobin determination

The presence of so many stabs and juveniles indicated a shift to the left and called for a very unfavorable prognosis.

Since it was impossible to express any material from any of the teats, we succeeded, by means of a needle and syringe, in obtaining a small amount of reddish fluid containing bits of pus from one of the glands. This yielded a pure culture of *Escherichia coli*, identified by Gram's stain, and lactose fermentation. *Esch. coli* is a short, rather plump rod, aerobic and Gram-negative. It is common in the intestinal tract of the various domestic animals and non-pathogenic there, but may produce serious disease once many become established in organs and tissues other than the intestinal tract.

August 29th, eight days after farrowing, the sow was still holding her own but not im-

proving. Her temperature was 103° F. There was still complete anorexia and rapid breathing. The two posterior mammary glands had by this time become quite soft and pliable, but those anterior to them showed no improvement, remaining very hard and swollen. In the meantime the owner of the sow had been bottle feeding the young pigs and they were getting along all right.

September 1, the sow showed definite signs of improvement, started eating a small amount of grain and objected vigorously to swallowing a capsule of sulfanilamide. It was thought that she would make more rapid gains if out on the farm, so the owner was advised to come after her. He was also advised to ship her to market as soon as she was well, as she would never be of any value as a breeding animal.

HAUTESSE E. RONDEAU

Shreveport, La.

Perineal Abscesses in a Mule Colt

A mule colt, six months of age, was presented for treatment August 10, 1944, with the history of difficult defecation. The anus was compressed on the right side and the colt was constipated.

Palpation of the perineal region just to the right of the anus revealed a firm, warm swollen area which was pressing against the anus, thus causing constipation. The colt was given a soapy enema and the feces removed from the rectum.

The firm area was punctured with a needle and blood stained purulent material bubbled through. The abscess was incised and about one-half pint of the material was drained out by compressing both sides of the abcess. Some of the material was collected for laboratory examination. Palpation of the inside of the cavity revealed that a thick capsule had formed, thus walling off the infection. The cavity was irrigated with 2% aromatic chlorazine solution and packed wtih gauze soaked in tincture of iodine.

In the laboratory, the hemorrhagic purulent material was cultured on blood agar plate. A shake culture was also made. The organisms proved to be hemolytic streptococci, and aerobic in growth characteristics.

The next day it was noted that the colt was having difficulty in urinating. Only by great straining was it able to void a small quantity of urine. On examination of the perineal region below the anus, a firm, warm and swollen area was discovered on each side of the midline. On incision, these areas proved to be abcesses containing the same type of material and encapsulated similarly to the first abcess. Immediately following incision of these abcesses, all three cavities were irrigated with 2% aromatic chlorazine solution and packed with gauze soaked in tincture of iodine.

Similar treatment was continued for two days longer and the colt was discharged able to defecate and urinate normally and well on its way to recovery.

DONALD HENSHAW

Litchfield, Minn.

Recurrent Pneumonia in a Dog

A collie pup was presented for examination three and one-half years ago. The pup had been run over the preceding day. The right ear drum was ruptured and the animal was sore and stiff. In the ensuing period this dog grew up and was normal in every respect, except it was subject to attacks of pneumonia. It was treated several times for this ailment and always recovered. This morning the dog was brought in, dead, and the owner wanted an autopsy held.

The necropsy showed that it had died of acute pneumonia but the thing of interest was that the stomach and liver were in the thoracic cavity, very securely adhered to the anterior surface of the diaphragm and the posterior lobes of both lungs. The heart was greatly enlarged. Evidently this dog had lived three and one-half years with the stomach and liver in the thoracic cavity.

G. B. ADAMS

Vernon, Texas

Lameness in Cattle Due to Cockleburs

The morning of March 5, 1944, Dr. Ben Shambaugh, Burlington, Kansas, received a call from a client who was very much concerned about his herd of cattle. The history obtained over the phone was that the previous day the cattle had been turned into a new stock field. That night two cows were reluctant to move and were stiff. The following morning, which was the morning the call was received, nearly all of the herd of 20 animals showed symptoms similar to those of the two cows. Some form of forage poisoning was suspected. A liberal supply of calcium gluconate, dextrose and sodium thiosulphate solutions were loaded into the car and the trip, which was about 20 miles, was made as quickly as possible.

Upon our arrival the cattle were found to be eating fodder which had been thrown out for them. They appeared normal in every way except they were reluctant to move and showed incoördination, stiffness and a strong

tendency to stumble. It was also noted that the sides and ventral parts of their bodies were matted with cockleburs. One of the animals showing pronounced symptoms was caught and upon examination was found to have a number of the burs in the axillary space. This area was badly inflamed and very sensitive. The burs were removed and the animsal was turned loose much improved, however, it was 10 or 15 minutes before she walked in a completely normal manner. A second cow was given the same treatment with similar results. The owner was advised to remove the cockleburs from the remaining animals and to harrow the stock field or use some similar means of breaking down the standing plants.

LEO R. WEMPE

Elkton, Ky.

Osteogenic Sarcoma in a Cow

A Hereford cow, aged seven, was presented for treatment on August 1, 1943. The owner stated she had been lame for over a year. He had first noticed the condition after a tornado in June, 1942.

There was an enlargement in the right scapular region and she favored this leg when walking. The temperature was 102.1° F., the pulse and respirations were normal. A diagnosis of bone tumor was made and slaughter was recommended.

The case described showing the location and the size of the tumor

A post-mortem examination revealed considerable edema medial to the scapula in the right thoracic wall. Hemorrhage was evidenced, but this could be attributed to the break in the bone tissue due to a recent fall. The muscles affected were the subscapularis, supraspinatus, infraspinatus, deltoideus, teres major, teres minor, trapezius and the long head of the triceps. There were approximately 30 nodules of beginning calcification in the lungs. The largest being one inch in diameter. There was no involvement of the lymph nodes.

The microscopic structure of this osteogenic sarcoma was a cellular, infiltrative type of growth, in which destruction of the normal elements was evident. The morphology of the cells concerned in the structure of the tumor was not constant. The cells were spindle, ovoid and polyhedral in shape and occasionally a giant cell could be seen. Mitotic figures were very numerous.

The osteogenic sarcoma dissected from the carcus and the adherent flesh removed. It weighed 32.24 pounds

Feldman says he has not observed true bone tumors, affecting the extremities of cattle. Apparently they are among the rarer forms of disease. The only case of osteoblastoma which he had observed in a series of 225 neoplasms obtained from bovine sources was a tumor weighing approximately 19kg removed from the scapula of an old Jersey cow.

The prescapular and prepectoral lymph nodes were involved metastatically in the Hereford cow and there were also many tumorous nodules throughout the lungs. The tumor removed weighed 14.65kg (32.24 lb.).

The subject of bone tumors is confused by the difficulty of separating the genuine osteoblastomas from the not uncommon osseous processes that are often associated with inflammatory and degenerative changes. Ossification of muscles, fascia, and aponeurosis following more or less chronic injuries are not infrequent among cattle and horses, but these changes are best considered as part of the phenomenon of repair of tissue and outside of the realm of neoplasia.

BILL GRIFFING

Pontiac, Ill.

REFERENCES

Feldman, W. H., Neoplasms of Domestic Animals.

Mercury Poisoning in Swine

A lot of somewhat more than 100 spring pigs which I vaccinated went along all right for about three months. Then the owner called me to see these pigs, stating that they were not doing well and intimating that it must be the fault of the vaccination. He thought his animals were coming down with hog cholera.

The hogs were found wandering aimlessly about the pasture and acting very stupid. One could pick up any of them anywhere, without remonstrance. Those first affected were totally blind and all became blind later. There was considerable gritting of the teeth and the temperatures were mostly below normal. None had an elevated temperature.

Post-mortem examination revealed little that was abnormal, only an occasional slight reddening of the gastric mucosa.

Questioning the owner, elicited the information that these hogs were all right until he began feeding them some unsold hybrid seed corn. This corn had been dusted with mercury bichloride during curing. Sometime after he began feeding this corn, he first noticed that the pigs were acting strangely.

The diagnosis was mercuric chloride poisoning, the prognosis hopeless, and treatment useless.

The swine eventually all died although, some of them lingered along for a considerable time.

J. H. SPENCE

Clinton, Iowa

The Use of Sulfapyridine in the Treatment of Chronic Necrotic Rhinitis ("Bull-Nose")

Six Chester-White pigs about six weeks of age were presented for treatment. There was a history of a progressive anorexia, swellings on the nose and jaw, dullness, and an inclination to lie around.

Upon clinical examination all cases showed inflammation and swelling of the nasal and ethmoid mucosa and variances in the amounts of distortion of the facial and nasal bones. The enlargement of the structures encroached upon the air-passages and caused the pigs to wheeze and sniffle. Temperatures ranged from 101.0 to 103.0° F. A confirmatory laboratory diagnosis was not considered necessary as the lesions were so typical of "bull-nose." The owner admitted that hygenic conditions were bad and the particular lot occupied by these pigs had been in use for three successive years.

The etiology of this condition is in part responsible for the selection of sulfapyridine sodium. Farquharson found that this drug is very effective against *Actinomyces necrophorus* which is considered to be present in the lesions of necrotic rhinitis; but whether it is the initial primary invader or just an opportunist is not known. Apparently several factors working together are necessary to produce the disease; the most important being insanitary surroundings. A mechanical abrasion seems necessary for the infective agent (which is probably filth borne) to gain entrance to the animal body.

Treatment was initiated in all cases with one grain of sulfapyridine sodium per pound of body weight administered *per os*. A protective dose of anti-hog cholera serum was given to each animal. The amount of the drug given daily to the hospitalized animals was not divided into a number of doses but each animal was given the required amount in one dose. This medication was continued for six days and then suspended for two days. After 10 days of the above therapy the following results were observed. The animals had regained their appetite; there was a definite increase in weight. In those pigs with marked facial distortion the swellings had receded as much as 60 to 75%. In those animals with only moderate facial swellings the faces appeared normal. The dyspnea and wheezing had disappeared and no nasal discharge was observed.

In former years the treatment of chronic necrotic rhinitis consisted of every known means of combating and eliminating the infection. No treatment used was found to be universally successful. The results obtained with sulfapyridine sodium is encouraging but the data is meager and only suggests the use of the drug in the treatment of this condition. At the time of this report one month has elapsed since the animals were discharged from the clinic. The recovery has been complete and there is every reason to believe that it is a permanent one. One should not lose sight of the fact that our principal efforts should be directed toward prevention through sanitation and proper feeding. The elimination of mud-holes is absolutely essential. Even if recovery does take place, ordinarily a "bull-nose" pig is an economic liability. For this reason alone control measures should be advocated rather than dependance upon curative measures.

EUGENE ADAMS

Manhattan, Kan.

Nuttall Death Camas Poisoning in Horses

Of all the poisonous plants which cause loss of the livestock on the western ranges, death camas is the most troublesome. Losses due to death camas have been more prevalent in sheep than in other animals. The death camas plants have long been known as poisonous, but it is only within comparatively recent years that definite knowledge of their properties has been acquired. As early as 1834 an explorer in the Northwest reported that his horses were made sick by a plant which, from the description, is believed to have been death camas.

These plants, which belong to the botanical genus Zygadenus, are recognized under a number of common names, of which death camas is the one generally used. In some localities the plants are called poison sego; quite generally throughout the Pacific States they are known as lobelia. Other names are soap plant, alkali grass, water lily, squirrel food, wild onion, mystery grass, and hog's potato.

All the different species of this plant have an underground bulb, the parts above the ground consisting of grass like leaves and a long flower stem which bears a cluster of yellow or greenish yellow flowers. The stems are stout, one to two feet high; the bulbs are ovate. The leaves are four to 20 inches long, one-fourth to three-fourths inches wide and somewhat curved. The lower leaves are sheathed at the base. The flower clusters are simple or branched and rather dense.

Death camas *(Zygadenus nuttallii)* was discovered near Fort Smith, Arkansas, by Thomas Nuttall in 1819. Its known range is in the upland prairie from Riley County, Kansas, south to southern Texas, extending east to Arkansas and west to include almost all of Oklahoma.

May 23, 1944, an ambulatory call was made east of Manhattan, Kansas, by the Department of Surgery and Medicine at Kansas State College. The owner stated he had turned a team of horses into the pasture the evening before and the next morning noticed them to be acting peculiarly. However they were hitched and driven approximately one mile when one horse became exceptionally weak. They were unhitched, returned to the lot and given a dose of sodium bicarbonate by the owner. At two o'clock that afternoon, the owner called the veterinary clinic at the college.

The horses were three and six years of age and in fair condition. The symptoms were well marked. The animals were salivating profusely, being very depressed and showing a staggering gait. Respirations were slowed, varying from eight to ten per minute and were very shallow. The heart rate was also slow, varying between 25 and 30 beats per minute. The temperature showed 98.5° and 95° F., respectively. The pupils of the eyes were markedly constricted and the blood was of an exceptionally dark color. The owner reported that the animals were urinating small quantities frequently and passing bright green feces.

An inspection of the pasture where the horses had been turned out showed that it contained many death camas plants which had been browsed upon recently.

Zygadenine, the crystalline alkaloid of *Zygadenus nuttallii*, is a circulatory depressant. The inhibitory action is brought about directly by stimulation of the inhibitory mechanism of the heart. Zygadenine has a specific action on striated muscle. A muscle under its influence will respond to stimuli as rapidly as normal muscle, but the period of relaxation is much prolonged. Respirations are influenced by the circulatory action and also directly, being temporarily arrested during the acute fall of blood pressure. Adsorption is rapid; little is known about the excretion, but it is believed to be eliminated in the urine and feces.

These animals were each given 250cc of a 20% solution of calcium gluconate and 500cc of 25% dextrose solution intravenously. Each was given a gallon of mineral oil by way of the stomach tube, and one-fourth grain of atropine subcutaneously. The owner was advised to keep the animals warm and quiet, and to see that they had access to water and food as they required it.

The following day the animals were again observed. The younger one of the two was eating, temperature, respirations, and heart rate had returned to normal, and she was showing no observable symptoms of illness. The older animal was down and still showing marked symptoms of poisoning. He was given the same treatment as on the preceding day and was reported to have died late that evening.

All species of death camas are poisonous. The losses due to the western species are largely among sheep. Nuttall death camas is especially destructive to cattle and may affect horses as shown by these cases.

Of the different species of death camas, the Nuttall species is the most poisonous.

There is no effective remedy known for death camas poisoning. It takes considerable quantities to poison an animal seriously. It is very important not to allow hungry animals to graze to any extent on places where these plants are growing in quantity. Death camas comes up in early spring before other grasses start growing and, on that account, are attractive to animals.

M. D. Morris

Manhattan, Kans.

Abstracts

Q Fever Communicable from Animals to Man

Derrick[32] studied 176 cases of Q fever in Queensland, Australia, and concluded that the ailment is a rickettsia disease and that the bandicoot, a native marsupial, is probably the natural reservoir of the infection. Various species of ticks are vectors, cattle probably being infected by *Ixodes holocyclus*. The infection is conveyed from cattle to man probably in the main by *Boophilus annulatus*. Of the 176 cases studied, 129 occurred in Brisbane and all gave a history of association with "meat works" (probably abattoirs).

Note.—Q fever virus has been isolated from two species of ticks in Montana.

Poliomyelitis of Swine

In an investigation of poliomyelitis as it occurs in swine in Germany, Fortner[33] gives the results as follows:

1. Infectious swine paralysis—poliomyelitis suum—is a strong neurotropic virus disease. The disease was experimentally produced in 362 hogs, 349 of which were infected intranasally. This method was found to be the most simple and most natural way of infection. The paralysis could be produced by feeding also, and by the subdural and the intramuscular inoculation. Only three of 29 pigs developed paraylsis after contact exposure.

Subcutaneous, percutaneous, intravenous, intravaginal and intraperitoneal exposure failed to produce the disease.

2. The virus was present in the brain and spinal cord of the pigs after the first or second day of paralysis. It was found also in the feces of four pigs during the prodromal of the paralytic stage. Attempts to recover the virus from the nose, urine, muscles, ischiatic nerve, gall-bladder and salivary gland were unsuccessful. A doubtful result was reported from testing the blood for virus.

3. The incubation period, including the prodromal stage, is usually 14 days (ranges from 7-34 days). The prodromal stage of about 1 to 3 days duration is accompanied by fever, weakness and loss of appetite. This is followed by the very characteristic appearance of paralysis ushered in by stumbling and falling. At this stage, half of the cases showed signs of excitement and cramps also, which, however, disappeared after 1 or 2 days. After the paralysis sets in the temperature falls below normal. Of 150 affected animals, 91 died within one week—usually in 3 to 5 days—from acute paralysis; 10 died during the second week, mainly as result of secondary pneumonia, and the remaining 49 survived. Twenty-six of these made a complete recovery in a few weeks but 23 suffered a chronic paralysis, muscle atrophies and contractures.

4. The post-mortem findings in those animals, which died during the acute stage, were negative. The histologic examination showed in each case of clinical paralysis a lymphocytic, vascular and perivascular cell infiltration and degeneration of ganglion cells in the brain and spinal cord, their favored locations being in the gray matter especially in the brain stem, the neck region and lumbar parts of the cord.

5. The virus proved to be invisible, could not be grown in the chick embryo, could be filtered through Berkefield-N-candles and was ultracentrifugal. It could be kept up to 20 months in 50% glycerin at 0°C. It was resistant for 21 days in brine at 6-10°C. and for three months at 15°C. It withstood putrefaction for six days and the drying at room temperature for 23 days. However, it was not infectious after 21 days putrefaction or after drying for 53 to 54 days. The virus was killed by heating it for one-half hour at 70°C.

Brain and cord containing virus proved to be infectious in dilutions of 1 to 1000.

6. Disinfectants which proved to be effective were formalin, chloramine, multicept, chlorinated lime, caporit and cresol sulphuric acid.

7. The pigs which did not come down with the disease after the first infection have been regularly reinjected with brain and cord containing virus after about five weeks. It was shown that the first injection often had caused a subclinical infection which had produced an immunity; this was plainly demonstrated in the numerically important nasal, subcutaneous and feeding exposures.

8. Pigs, which had recovered from the paralysis, were, without exception, immune against the reinfection with homologous or heterogenous virus.

9. Immunization trials with simple subcutaneous pretreatment of the animals with brain and spinal cord emulsions containing virus and with formalized brain-cord vaccine were not satisfactory; better results were obtained with double pretreatment with formalized vaccine.

10. Serum from pigs which had been pretreated repeatedly with virus was of no value for prevention or treatment.

11. Nasal lavage with 2% zinc sulfate re-

[32] Derrick, E. H., Epidemiology of Q. fever. *J. of Hyg.* (London) 43, p. 357 (April). Briefed in *J. Am. Med. Assn.*, 125:15, p. 1067.

[33] Fortner, J., Experimental investigations of infectious swine paralysis (trans. title), *Ztschr. f. Infektkr. Parasit. Krk. und Hyg. der Haustiere.* 59: 1 and 2.

sulted invariably in a protection of two weeks duration against intranasal infection. Subcutaneous injection of vigantol delayed the onset of paralysis after intranasal infection in about 50% of the cases.

12. No relationship between swine paralysis (polio), hog cholera or enzootic pneumonia could be detected. Another article which appeared in the same issue of the journal entitled: "Histo-pathology of the Central Nervous System in Poliomyelitis of Swine" by Prof. Dr. Dobberstein is also of interest.

Since there are no macroscopic lesions produced in this disease and its symptoms are not markedly different from paralysis in swine resulting from other causes, sporadic cases of infectious paralysis are apt to go unrecognized.

H. H. RUHLAND.

Treatment of Eye Infections with Penicillin

Acute conjunctivitis and blepharitis, chronic blepharitis, infected corneal ulcers, perforating corneal injuries with prolapse of the iris and risk of intraocular infection were found to be suitable for treatment with penicillin.[47] The organisms found in ocular infections which are susceptible to penicillin are *Staphylococcus pyogenes,* the hemolytic streptococcus, the gonococcus and the pneumococcus. In ophthalmic work penicillin can be used either in the form of drops or in an ointment. Irrigations of the anterior chamber can be carried out in cases in which infection has taken place through a perforating wound. Only small quantities need be used in the eye. Doses of 1000 units are sufficient to treat many conditions. The calcium and sodium salts of penicillin have been well tolerated in the eyes and have been injected into the anterior chamber. Penicillin is also of proved value as an ointment made up in a soft base and containing 500 units per gram.

Use of Vitamin C to Prevent Shock

Although the incidence of death as a result of traumatic shock[46] has been reduced during the past few years, the entire problem of related factors present in shock has not been solved. In the study of this condition in animals it has been found that scorbutic animals are more susceptible to shock than normal animals. Repeated trauma in animals with normal vitamin C intake increases resistance to shock, but that was not found to be true in the case of scorbutic animals. The use of massive doses of vitamin C immediately following trauma increased the survival time of the animals. Since in major surgery the vitamin C level diminishes post-operatively, the authors believe that intravenous vitamin C might be of value in preventing shock. If the vitamin C reactions are the same in man as in animals, the need of adequate vitamin C intake in soldiers in combat or preparing for battle becomes apparent.

Management of Wounds

To wounded patients brought to a receiving ward[45] in the South Pacific area morphine and plasma were administered immediately as indicated; 0.5cc of tetanus toxoid was given unless statement appeared of immediate prior administration; malaria smears were taken and pending report, atabrine 1½gr per day was administered; oral administration of sulfathiazole in divided doses totaling 4 to 5gm daily was routinely practiced for the first 3 days in all wounded patients; multiple vitamin pills were given daily, and ferrous sulfate pills when indicated. In the local treatment of wounds, washing with white soap and water, shaving and drying with ether-alcohol was the first step; when wet dressings were indicated, aqueous azochloramide was used freely. After débridement, removal of foreign bodies and reduction of fractures, sulfanilamide powder was liberally instilled and sterile dressings were applied. Wounds were not sutured and subsequent dressings were infrequent.

Feeding for Maximum Vitamin A in Butter

Wilbur, Hilton and Hauge in a series of three articles[29] shed considerable light on the question of the varying vitamin A content of butter. Guernsey cows used in the experiment were depleted of vitamin A until the content of the vitamin in butter made from their milk fell to 17 I.U. per gram. Vitamin A was then included in the ration at levels of 35,000, 70,000, 105,000, 140,000 and 280,000 I.U. daily. There was no increase in the vitamin A content of the butter until the intake of the vitamin reached the 105,000 level at which time the increase was slight. With a daily intake of 140,000 units the butter content rose to 42 I.U. per gram and at the 280,000 level the butter content rose 49 I.U. per gram.

In a second experiment the procedure was

[47] Cashell, G. T. W., Treatment of eye infections with penicillin. *Brit. Med. J.*, 1:420, 1944. Abst. from *What's New.*

[46] McDevitt, E., Duryee, A. W., and Lowenstein, B. E., Use of vitamin C to prevent shock. *South. Med. J.*, 37, p. 208, 1944. Abst. from *What's New.*

[45] Auster, L. S., Management of wounds in the South Pacific area. *U. S. Naval Med. Bul.*, 42, p. 1009, 1944. Abst. from *What's New.*

[29] Wilbur, Hilton and Hauge, *J. Dairy Sci.*, 23, p. 765 (1940); 27, pp. 57 and 63 (1944).

reversed and the cows were fed 420,000 units daily till the butter content reached 49 units, then the vitamin A in the ration was reduced gradually. The decrease in the vitamin A content corresponded to the increase in the first experiment.

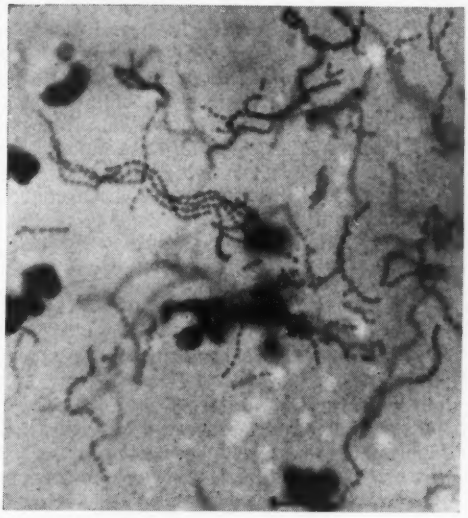
In a third experiment vitamin A was supplied to the animals in the form of carotene. Here the increase and decrease of vitamin A in the butter exactly paralleled the results when vitamin A was included in the ration, however, it required approximately three times as much carotene as vitamin A to enrich the butter equivalently.

Summarized, their findings indicated that to produce butter of maximum vitamin A content (50 I.U. per gram) Guernsey cows require a minimum of 280,000 I.U. of vitamin A or 770,000 units of carotene daily.

Effect of Incomplete Milking on Mastitis

Five cows[26] having eight quarters infected with *S. agalactiae*, five quarters shedding staphylococci, and seven quarters free of any infection were selected for the first trial on incomplete milking. An attempt was made to leave about 2 lb. of milk in the udder of each cow at every milking over a 13-week period. Under this system the noninfected quarters continued to produce a normal milk, four of the five quarters shedding staphylococci infrequently showed visible particles in their foremilk, while every quarter harboring *S. agalactiae* developed readily visible symptoms of mastitis. The strip-cup test became positive with two *S. agalactiae*-infected quarters during the first week of incomplete milking, with four such quarters during the second week, one infected quarter during the third week, and another during the fifth week. With seven of the eight infected quarters, flakes, clots, shreds, and sometimes thick pus were found in the foremilk with great regularity as long as incomplete milking was continued. Two quarters developed acute mastitis, and their parenchyma, as well as that of another quarter, increased in firmness. The chlorine content and the cell count of the *S. agalactiae*-infected milk increased significantly as soon as the incomplete milking was started, whereas no appreciable changes were observed in the secretion of the normal quarters. The total bacterial count of both normal and infected milk was not affected to any great extent. When thorough milking was resumed there was a definite tendency toward a return to a visibly normal secretion, although with three quarters production was considerably reduced and the milk was somewhat watery.

In a second test, two cows with noninfected udders and four cows having a total of six quarters infected with *S. agalactiae*, six quarters shedding staphylococci, and four quarters free of any infection were not stripped after normal machine-milking over a period of 17 weeks, except after two evening milkings each week to ascertain the quantity of milk left in the udders. The average amount of strippings per udder varied from 0.52 to 1.1 lb. per milking, and the average quantity retained by the individual quarters per milking varied from 0.03 to 0.4 lb. The noninfected quarters continued to produce a normal secretion, four of the six quarters shedding staphylococci infrequently contained visible particles in their foremilk, and the quarters harboring *S. agalactiae* reacted in a variable manner to nonstripping. Among the *S. agalactiae*-infected quarters, the two retaining the smallest average quantity of strippings, 0.05 and 0.10 lb. of milk per milking, developed the most pronounced clinical symptoms of mastitis, while quarters retaining from 0.2 to 0.4 lb. of milk per milking only infrequently showed mild evidence of mastitis. In every case, however, the inflammatory process in the *S. agalactiae* quarters was aggravated to some degree, as indicated by a significant rise in cell count when nonstripping was practiced. The chlorine content and the bacterial count of both normal and infected milks were not affected materially.



Infected milk: Streptococci and leucocytes in excess of one million perr cc. X 1500

[26] Schalm, O. W., and Mead, S. W., The effect of incomplete milking on chronic mastitis caused by *Streptococcus agalactia*. *J. Dairy Sci.*, 26:9, pp. 823-832, 1943. Abst. from *Exp. Sta. Rec.*, 91:2, p. 195.

Action of Sulfonamides in Virus Infections

It is pointed out[44] that the most fundamental fact about sulfonamides is that they are general cell inhibitors, acting as inhibitors not only toward bacteria, but also toward other cells of practically every variety. An exceptional feature about sulfonamide inhibition of bacteria is the complete counteraction of it by substances such as para-aminobenzoic acid. Since there is adequate evidence to prove that some of the viruses are susceptible to sulfonamides and some are not, it is suggested that those viruses acted upon by the sulfonamides may be those which require p-aminobenzoic acid or a similar substance used by the sufonamides; for all other viruses this substance may not be an essential metabolite. So far as is known, all viruses are associated with living cells. It is thought possible that the sulfonamide action on some viruses may be indirect—possibly through an action primarily on the host cell to render it an unsuitable abode for the virus.

* * * *

Control of Sheep Parasites

This discussion,[50] one of a series[50a] on the same subject, is concerned with the effect of administering anthelmintics to ewes and lambs during the winter.

Fifty lambs and 160 ewes were used in the experiment. They were brought into the barn in November. Although the flock had experienced severe losses from parasites during the preceding summer the level of parasitism in the ewes was not high in November. The lambs, however, were still suffering from a fairly heavy infection.

The sheep were divided into five lots. Lot 1 received no treatment; Lot 2 received copper sulfate-nicotine sulfate treatments, Dec. 11, Jan. 25 and April 28. Lot 3 received phenothiazine (25gm) Dec. 18 and April 23. Lot 4 received phenothiazine Nov. 23, Jan. 25 and April 23. Lot 5 (the short yearlings) was given the same treatments as Lot 4.

There was no significant difference in infection level in any of the groups of ewes, which remained low until March 1st. Thereafter the infection increased in all groups. However, the barns in which lots 1, 2 and 3 were housed were cleaned Jan. 7. The barn in which Lot 4 was housed was cleaned Jan. 7 and Feb. 15. The level of infection rose more slowly in this latter group.

The authors conclude that anthelmintic treatment of sheep during the winter is of no benefit in the climate of Michigan since the temperature is so low that few parasitic eggs become infective. The first treatment of Lot 5—the heavily infected lambs (phenothiazine Nov. 23) however, was an exception. These sheep were materially benefited by this first treatment which lowered their fairly heavy infection to the approximate level of that of the ewes.

Beginning in early March the parasite infection rose rapidly in all groups until the last week in April.

The five lots of ewes and their lambs were moved to pasture May 22, and the infection of the lambs recorded for several months. The critical period for the new crop of lambs is from the middle of May till the end of June. The lambs of the ewes receiving three treatments of phenothiazine (lots 4 and 5) suffered least; those of the ewes receiving two treatments of phenothiazine (Lot 3) were next and those of lots 1 and 2 acquired the heaviest infection—there being no difference in the degree of infection between lambs of untreated ewes and those receiving three treaments of copper sulfate-nicotine sulfate.

* * * *

Anthelmintic Treatment of Lambs

This is the third and last[51] of the series of articles noted in the foregoing. The conclusions drawn from these experiments contrast with orthodox practice. The lambs produced by the ewes mentioned in the preceding abstract were allowed to become heavily parasitized, as determined by fecal egg counts, and then divided into five groups. One group was drenched with copper sulfate-nicotine sulfate every four weeks. A second was drenched with phenothiazine at the same intervals, a third were given tetrachlorethylene in capsules at four-week intervals and the fourth received phenothiazine and salt (1 to 14) as the only salt available. The fifth group comprised untreated controls. There were 90 lambs in this untreated group and nine in each of the other groups. Although all were heavily parasitized, the level of infection differed rather widely, depending upon the treatment the ewes had received during the preceding winter; actually varying from 4,000 E.P.G. for the lambs of ewes drenched with phenothiazine to 12,000 E.P.G. for the lambs of ewes drenched with the copper sulfate-nicotine sulfate. Although the authors

[44] Henry, R. J., Suggested mode of action of sulfonamides in virus infections. *Bact. Rev.*, 7, p. 175, 1943. Abst. from *What's New.*

[50] Hawkins, Philip A., Cole, C. L., Kline, E. E., and Drudge, J. H. Studies of sheep parasites II. Winter treatment of the breeding flock. Reprint from Mich. Agr. Exp. Sta. *Quar. Bul.*, 27:1 (August), 1944.

[50a] Studies of sheep parasites I, the course of untreated nematode infections. *Vet. Med.* 39:4, pp. 154-161 (April), 1944.

[51] Studies of sheep parasites III, Treatment of lambs. Reprint from Mich. Agr. Exp. Sta. *Quar. Bul.*, 27:1, August, 1944.

disregarded it; it appears this initial difference in the severity of the parasitism may have had a bearing on the outcome, at the end of the experiment; i.e., on the weight of the lambs.

The lambs were not benefited by any of the anthelmintic treatments and, except for the phenothiazine-salt mixture, they were definitely injured by each of the medicaments, as judged by the gains in weight during the season. The hemoglobin content of the blood and the red cell count were unfavorably affected by all the anthelmintics except the phenothiazine and salt, but not materially; i.e., these factors were only a little lower in the treated groups than in the control group. As compared with another group of parasite-free lambs, however, these factors were low in all five experimental groups.

One inescapable conclusion from these experiments is that lambs are permanently injured by a heavy infection with round worms. Another conclusion is that the natural resistance to intestinal parasites, which the lambs develop from exposure, contributes far more importantly to their survival than any known anthelmintic is capable of doing.

A striking feature of the record of these experiments is the close duplication in the control group of the fall in parasitic infection following all anthelmintic treatment, except drenching with phenothiazine. These experiments indicate that the lowering of the level of infection heretofore attributed to copper sulfate-nicotine sulfate treatment is due, mainly, to a naturally developed immunity to the parasites. This accords with an experiment[52] at the Ohio Station in which lambs given the copper sulfate-nicotine sulfate treatment at three-week intervals throughout the pasture season made only slightly better gains than untreated controls, and not nearly as good gains as similar lambs which were creep-fed a small amount of grain.

The authors conclude:

1. Phenothiazine in salt, copper sulfate-nicotine sulfate and tetrachlorethylene all failed to remove round worms under the conditions of this experiment.

2. Phenothiazine as a drench was very efficient in removing round worm parasites and maintaining the infection at a low level, but did not eliminate it.

3. Copper sulfate-nicotine sulfate, tetrachlorethylene capsules and phenothiazine drench given at four-week intervals all interfered with weight gains in the lambs.

The recommendations for the control of round worms in sheep are:

1. Bed the ewes well during the winter, clean and rebed, preferably twice during the winter.

2. Drench the ewes with phenothiazine, and place both ewes and lambs on a mixture of phenothiazine and salt, 1 to 14, three to four weeks before going to pasture. Keep this mixture before the flock while on pasture.

3. Watch the flock for any evidences of parasitism while on pasture. If they occur, drench the individuals with phenothiazine.

[52] *Vet. Med.*, 33:11, p. 489, 1938.

Artificial Insemination

For the collection of semen,[34] the usual type of rubber artificial vagina is used with a double wall unsilvered vacuum cup graduated in the normal way. An alternative is the use of a rubber cone which fits over the end of the vagina, into the end of which is fitted a pyrex test tube. The tube and cone are bent back alongside the vagina for warmth immediately before collection. A short vagina is chosen and the bull ejaculates directly into the cone, giving a very clean sample. After collection the semen is immediately examined for motility and a small quantity drawn off for counting.

The semen is promptly diluted with fresh egg yolk-phosphate solution, the formula of which is as follows:

KH_2PO_4—0.2gm
Na_2HPO_4—$12H_2O$—2.0gm.
Glass distilled H_2O—100cc

An equal volume of fresh egg yolk and the above solutions are mixed together and this mixture is used for diluting the sperm. Dilution is graded according to the average sperm count of the bull used. This ensures that with a normal dose of 1cc of diluted semen the cow gets a constant number of sperms irrespective of the bull used. A 5cc ejaculate with an 800 to 1,000 count and diluted 1 to 6, therefore, should be sufficient to inseminate 35 cows. For short distances the semen is carried in a widemouthed thermos flask, in the bottom of which is a piece of ice covered with a layer of cotton wool. An extremely simple and efficient device consists of a straight glass capillary tube with the end drawn out and tapered, holding a little over 1cc of fluid when full. To this tube a 2cc glass syringe is attached by means of short length of rubber tubing (a piece of the short air tube of milking machine cups being ideal). A large number of pipettes can be sterilized and a dozen or so kept available. Two tubular metal containers are used for this purpose, one containing the sterile pipettes which, after use, are placed in the other to be returned to the laboratory for washing and re-sterilization. Semen is drawn into the pipette but never into the rubber connection or syringe and a

[34] Rowson, L. E. A., A year of artificial insemination. *Vet. Rec.*, 56: 21, pp. 165-167, 1944.

new pipette is necessarily used for each animal. The technic used at Cambridge University consists in depositing the semen at the bifurcation of the uterine horns. The cervix is picked up per rectum and the glass pipette introduced into the vagina, worked through the cervix and the sperm injected slowly. Many animals have been inseminated after estrus has ceased with good results. In some cases no follicle has been palpable in either ovary, rupture already having taken place, yet conception occurs quite frequently—A. H. BRYAN, Major, V. C.

Penicillin Absorption

In experiments to find methods for administration[54] of penicillin which would decrease the rate of absorption and prolong the duration of an effective level in the blood it was found that single injections of penicillin in beeswax-peanut oil mixture will produce and maintain levels of penicillin in the blood for seven to 10 hours and that these mixtures maintained their potency at room, incubator, and refrigerator temperatures for thirty to sixty-two days and showed no signs of deterioration nor were abnormal reactions, locally or constitutionally, produced by this

Eleven of twelve patients with gonorrhea were cured by a single injection of penicillin in beeswax-peanut oil mixture.

It is hoped that this method of producing an effective enduring blood level of penicillin will aid not only in determining the optimum amount of penicillin necessary in various diseases but will decrease the number of injections and shorten the time required for treatment. Studies along these lines are now in progress.

Vitality Test for Bovine Semen

The decrease in motility of the spermatozoa in bull semen samples,[53] diluted with yolk-citrate and stored 10 days at 5°C. (41°) after having been brought to storage temperature in steps of a 5°C. drop each 10 minutes, was directly and significantly correlated with the decrease in motility for similar samples stored in water baths for one hour at 46.5°C. (115°F.) for 45 minutes at 47.0°C., and for 30 minutes at 47.5°C. The correlation coefficients were 0.9088, 0.8979, and 0.6731, respectively. Such an incubation test is suggested for use in determining relative viability of the spermatozoa in semen samples under the same and different handling technics.

A test for quality of semen in which the rate at which semen diluted with yolk-citrate diluent will reduce a dilute solution of methylene blue was suggested for use, especially by operators of artificial breeding circuits. The quantitative relationships between this test and several factors affecting it were presented. Under standard conditions the test was shown to be largely dependent upon the concentration of spermatozoa, the motility of the spermatozoa, and the concentration of ascorbic acid in the semen.

The two tests may be combined for each semen sample. Thus information may be obtained rapidly on initial motility, duration of motility, and relative metabolic rate as influenced mainly by spermatozoan concentration and motility, and ascorbic acid content of the semen. All of these factors now appear to be important as indications of the potential fertilizing capacity of semen.

Malignant Edema in Swine

This disease has received but slight attention in veterinary literature[48] and has not been reported previously in Britain. The author reports nine cases occurring on five premises, and he surmises the condition may be more common than the literature would indicate.

The symptoms include swelling, most commonly of the throat and axillary region, but may occur in the hind quarters. In one instance the primary site of infection was in the intestinal wall. The swellings are similar to those of blackleg but are less crepitant. In the cases reported emphysema could be detected ante-mortem only when subcutaneous tissue was involved and not always then. Lameness was present when muscles of the legs were involved. Death occurred in 12 to 24 hours.

The lesions are of a hemorrhagic, edematous nature with some emphysema if the musculature or loose connective tissue is involved. Muscle lesions are dark chestnut in color with small, gas cavities discernible on careful inspection. Putrefaction of the carcass is very rapid.

Both the symptoms and lesions to a degree resemble those of blackleg and also of anthrax but the symptoms are more acute than those of anthrax in swine.

In all cases reported the hogs were confined in very filthy quarters and it is assumed infection was *via* wounds in the skin or abrasions of the mucous membrane of the mouth or esophagus. Organisms found in the lesions were cultured and determined to be *Clostridium septicum.*

[53] Beck, G. H., and Salisbury, G. W., Vitality test for bovine semen. *J. Dairy Sci.*, 24:6, pp. 471-482.

[54] Romansky, Monroe J., Capt., and Rittman, Geo. E., Technician, Penicillin, prolonged action in beeswax-peanut oil mixture, *The Bulletin*, U. S. Army Med. Dept., 81, pp. 43-49 (October, 1944).

[48] Steward, J. S., Malignant edema in swine; probably due to *Clostridium septicum. Vet. Rec.*, 56:36, p. 321, 1944.

Book Reviews

Atlas of Avian Anatomy, Osteology, Arthrology, Myology. By *Frank Wilbut Chamberlain,* D.V.M., formerly Professor of Anatomy, Michigan State College. 213 pages (11x14 inches), illustrated with 95 large plates from original drawings. Published by the Michigan State Agricultural Experiment Station, East Lansing, 1943. Price $2.50.

This is a magnificent—a deluxe volume. It adheres closely to the title and is strictly an atlas, there being but 45 pages of descriptive text matter, the remainder being plates and explanations of the plates. The text is highly technical and much condensed. Except for muscles, functions of organs are not given. Differences in the fowl, goose, swan and turkey are described. Apparently one or more companion volumes is to follow on splanchnology, angiology, neurology, etc. When completed it will constitute an avian anatomy that will compare favorably with the best anatomy atlases of laboratory or other animals and man.

* * * *

Turkey Management. By *Stanley J. Marsden,* B.S., M.S., Poultry Husbandman Beltsville Research Center, U. S. Department of Agriculture and *J. Holmes Martin,* Ph.D., Head of Poultry Department, Purdue University. Second Edition, 752 pages, 142 illustrations. Published by the Interstate Publishers, Danville, Ill., 1944. Price $3.50.

This is a work, and a very comprehensive one, on turkey husbandry. That the authors are keenly appreciative of the importance of disease as a controlling factor in turkey production is evident throughout the work. On the first page of the text they say:

"Farmers in all sections of the United States have been interested in turkey production and would indeed have made it an important source of farm income had not the disease problem played such an important role."

An account is given of turkey production which became important in the New England States in 1880 only to be abandoned after a few years and taken up in New York and to continue the trek westward to California which held first place in turkey production in 1940. "In each area in turn, turkey production had a good initial start and became an important source of farm income, only to be abandoned when the apparently insurmountable disease problem entered the picture."

That confinement is not incompatible with disease control in turkey production nor wide range a solution of the problem is illustrated by an instance of production of 22,000 pounds of turkeys in one year on a half-acre of ground and several failures to produce as much as a half-dozen good birds on a 200-acre farm.

All phases of turkey production, management, feeding, breeding; artificial incubation, brooding and rearing; marketing, selection and grades; caponizing and artificial insemination are discussed in much detail. In addition there are chapters on classification, origin and history of the turkey, terminology and varieties, turkey shows and showing, malformation and bad habits and an informative appendix.

The chapter on terminology and varieties includes a surprisingly extended vocabulary—

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY Medicine, 7632 S. Crandon Ave., Chicago 49. Bulletins and Circulars should be requested direct from the address given in the notice. Generally they are supplied free unless a price is stated.

evidence that one should possess considerable erudition as well as discretion to really "talk turkey." Apteria, caruncles, filoplumes, overflow, uropygial, calamus, rachis and remiges are examples of words in turkey talk.

The discussion of feeds and feeding, including the discussion of vitamins and deficiency diseases, occupies more than a hundred pages and goes into great although not tiresome detail, except perhaps in the number of feed formulae given. Of the different feed combinations proposed by the various experiment stations there seems to be more than a sufficiency.

The discussion includes chapters on disease prevention and sanitation and on diagnosis and control of diseases and parasites. An index to these chapters is to be found in this statement: "If turkey raisers would become more and more concerned about the practices that avoid disease, rather than the method of diagnosing and treating some disease that they or their neighbors might have in the turkey flock, it would redound to the advantage of the turkey industry."

One important objective of the discussion apparently is to save the industry "millions of dollars that have been spent in past years by turkey raisers for so-called remedies." The importance of early and accurate diagnosis is emphasized. The difficulty of making an accurate diagnosis is stressed. All disease, other than nutritional ailments, is divided into three groups. A large group for which there are no

remedies and prevention by good sanitation, good hygiene and good management must be relied upon for their control. A second group includes only fowl pox, with the possible addition of cholera and typhoid in which vaccination is a useful protective measure. The third group includes infestation by fleas, lice, mites, roundworms, scaly leg mites and ticks for which medication is recommended. A minor criticism of the discussion of disinfectants, is the important place given to cresols and the minor one to lye. Perhaps this is a concession to the layman's faith in powerful odors.

The conviction is firmly held among experts in avian disease control, that the average veterinarian should know more about poultry husbandry than he does. This work supplies the information that some of the experts think we need.

Dogs for Democracy. — The Story of America's Canine Heroes in the Global War. By *Thomas Young* with a foreword by *Franklin P. Adams*. Cloth bound, 32 pages, 19 illustrations. Published by Bernard Ackerman, New York, 1944. Price $1.00.

This little book, it contains but a dozen printed pages and 19 splendid illustrations, tells briefly, very briefly and sentimentally the story of War Dogs. It is suitable for the veterinarian's waiting room table and for a gift.

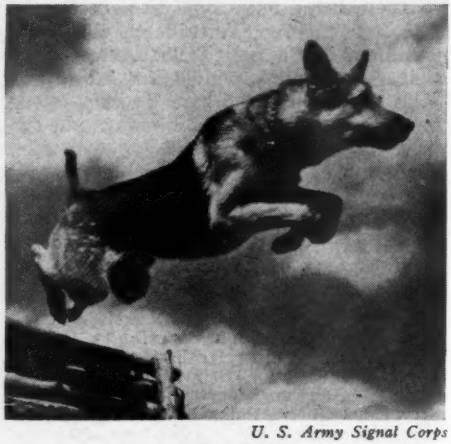
* * * *

Dogs at War.—By *Clayton G. Going*, Overseas News Division, Office of War Information. 211 pages, 32 full-page illustrations. Published by The MacMillan Company, New York, 1944. Price $2.50.

This is a book that should please a wide circle of readers. It contains much accurate information about the armed forces—and who isn't interested in that—and many remarkably entertaining stories of individual dogs, all floating in an ocean of mush that must thrill and delight all cynophiles and their number, of course, is legion.

A factual account is given of the procurement, training and use of War Dogs by the Army, the Marine Corps and the Coast Guard —the three branches of the armed forces that possess War Dogs. The army training given these dogs is simple, but expensive. They are taught to do a few things well. The basic training, which is essentially a training in obedience and physical hardening, is the same for all War Dogs. Following this, depending upon the adaptability of the animal or the needs of the Army, the dog receives special training for sentry, attack, scout, messenger or casualty duty.

Large numbers of attack dogs are used chiefly by the military police and to guard supply depots and war factories; lesser numbers by the Marines. Silent scout messenger and casualty dogs are occasionally used for special though important duties. All three services find much use for dogs on sentry duty where their senses of hearing and smell and of vision at night, being much superior to those of man, are of the greatest value. A small number of dogs are employed in the detection of non-metalic, anti-personnel mines.



U. S. Army Signal Corps

A War Dog

The dog stories are interesting, well told and documented. They are not confined to War Dogs but include tall tales of mascots and "G.I." dogs—heroes all and endowed with all the reasoning faculties of man, all the instincts of the animal kingdom and endurance, courage and sagacity beyond compare.

A brief account is given of Russian, British and Swiss War Dogs. The British and Swiss have fewer dogs in their armed forces than we have; the Russians far more. Unlike our army the Russian army uses dogs as a weapon, e.g., against small and medium tanks. They also use them largely to locate and transport casualties in snow too deep for mechanical transportation and also for all the purposes for which they are employed in our Army.

War Dogs are procured exclusively through Dogs for Defense, Inc. The author implies the idea of using dogs in our armed forces originated with the founders of this organization. This is, as most readers know, an error. The idea originated with the veterinary profession, as did plans for procuring and training them.

* * * *

★ ★ ★ BUY WAR BONDS ★ ★ ★
AND HOLD THEM

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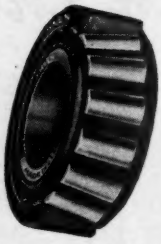

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1. Thorp, W. T. S.; Pisciotta, V. J., and Grundy, C. B., J. Am. Vet. M. A. 104:274, May, 1944

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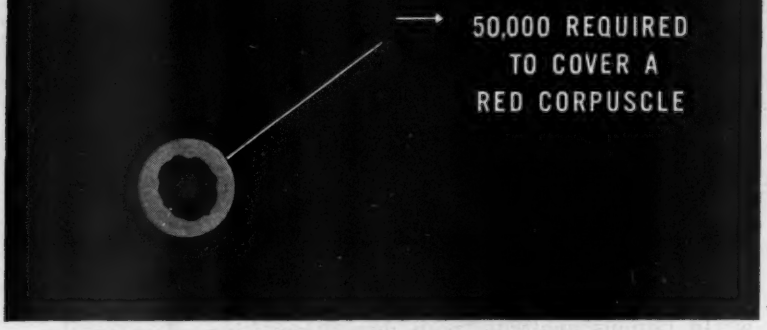

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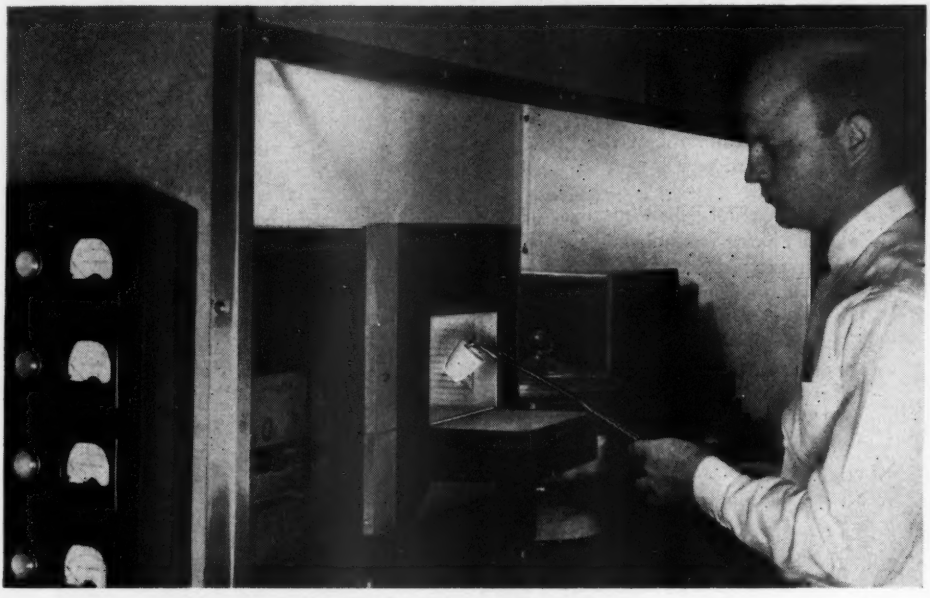

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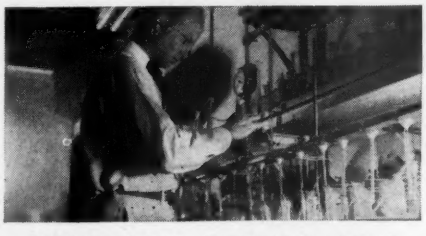

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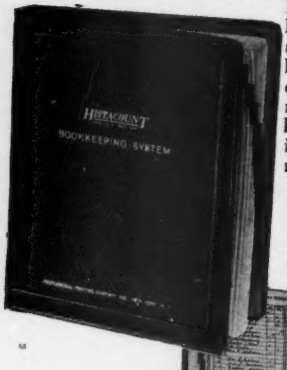

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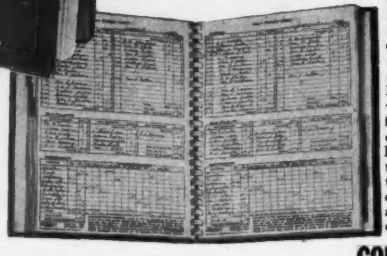

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You've backed the attack—now speed the victory!

Veterinary Magazine Corporation

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council

To bring your dogs better health through better food—

SCIENTIFIC RESEARCH DISCOVERED A NEW DEHYDRATION PROCESS

When the use of tin containers was discontinued by government order, Swift & Company scientists and engineers searched for a dehydration process that would remove Pard's moisture but would not remove Pard's fine food values.

Finally, in January 1942, they found the answer. Avoiding the usual method of dehydrating each ingredient *separately* at *high* temperatures, Swift researchers found a wholly different process.

They mixed Pard's fresh meat by-products and other wholesome foods in their natural *moist* state before dehydration. Then, from the *entire* fresh mixture, they removed the moisture by slow, low temperature dehydration.

Pard Dehydrated was then proven in the Swift Kennels. Three generations of dogs, weaned to this fine food, ate it exclusively every day —and thrived on it! Not one dog lost his appetite for Pard Dehydrated. Not one dog was sick a single day due to dietary ailments.

This was the proof—conclusive proof that Swift's unique dehydration process preserves Pard's nourishing goodness.

Pard Dehydrated is a shining example of how Swift & Company's modern research methods work to bring your dogs better health—through better food.

Swift & Company
Chicago

Fresh Meat By-Products *and other wholesome foods are included in the Pard formula—a well balanced formula, rigidly adhered to and nutritionally excellent.*

Pard Dehydrated contains every known essential for good nutritional health.

BUY WAR BONDS!

WHAT THE

VETERINARY PROFESSION

MEANS TO MANKIND

Veterinarians and Post-War Public Health

● Doctor D. D. Carr, a physician, president of the Kansas Public Health Association, following a meeting to plan the nation's future public health program, made this statement: "Veterinary medicine is definitely in the 'blue-print' for post-war public health service. * * * Veterinarians are contributing to public health. Every time they vaccinate an animal or do other preventive medicine they protect the health of the people."

To the 1944 meeting of the Kansas Public Health Association he said: "Veterinarians can do a job that no one else can do. * * * When I was in charge of a public health unit in Alabama there was a veterinarian also on the staff and I immediately realized the value of his training. When I came to Topeka I was glad to find there also was a full time veterinarian on the staff."

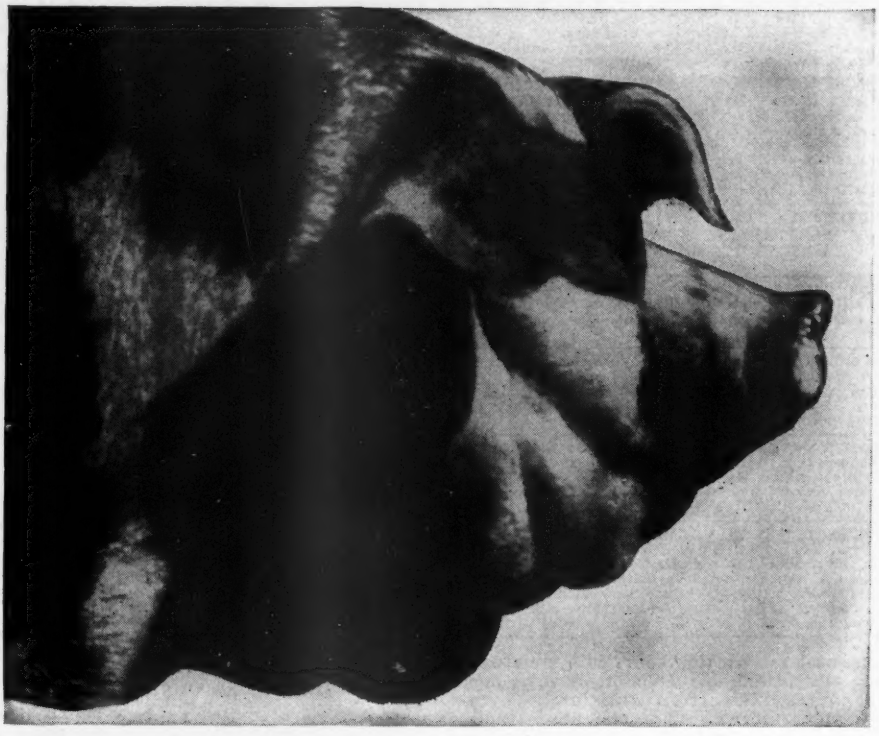
Because so many diseases of animals are transmissible to man, the trend in public health work is, as Dr. Carr indicates, to make full use of the specialized training of the veterinarian.

One of a series of advertisements on behalf of the Veterinary Profession published by

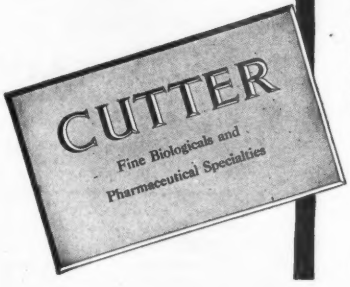
ALLIED LABORATORIES, *INC.*

Operating:
Pitman-Moore Co., Indianapolis, Ind.
Royal Serum Co., Kansas City, Kansas
Sioux City Serum Co., Sioux City, Iowa
Sioux Falls Serum Co., Sioux Falls, S. D.
United Serum Co., Kansas City, Kansas

Copies of this page, free of advertising, sent on request.



IF HOGS COULD TALK— this sow would say a mouthful about CUTTER B-T-V



First off, she'd pay a tribute to those forward-looking veterinarians who recognize B-T-V for what it is: the veterinarians' first and finest chance to wipe out hog cholera from America. And she'd give you the reasons, too:

1. B-T-V *eliminates the use of live virus,* thus enabling you to keep your clients' premises clean.

2. B-T-V makes it possible for you, and other qualified veterinarians, to vaccinate *any time*— all, or part of a herd—and with no flare-ups following its use.

3. B-T-V does not throw pigs off feed. As a rule, they gain faster, reach market quicker.

This old sow has seen plenty of cholera in her day. But thanks to you—and Cutter B-T-V—her children will be safer, and healthier! Are you using it, doctor?

Cutter Laboratories, Berkeley, California
111 N. Canal St., Chicago 138 W. 53rd St., New York

Classified Advertisements

For Sale, Wanted, etc., $2.50 for 25 words or less; additional words, 6 cents, payable in advance. 25 cents extra when replies are sent in care of VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago. Copy must be received by the 3rd of month.

POSITION WANTED BY NOVEMBER GRADUATE with mixed or small animal practitioner. Experienced; references. Address No. 474 care of VETERINARY MEDICINE.

POSITION WANTED BY RECENT GRADUATE. Draft exempt, single. With busy small animal practitioner. Address No. 472 care of VETERINARY MEDICINE.

NOVEMBER GRADUATE desires position as assistant in good large animal or mixed practice. Capable all around and have had experience. Address 473 care of VETERINARY MEDICINE.

FOR SALE OR LEASE: Practice established twenty years. Ill health and age reason for selling. Cheap rent for building. Address 3631 Elston Ave., Chicago 18, Illinois.

STANDARD REFERENCE WORK on all dog breeds and all dog subjects, complete with supplements. Judy's Dog Encyclopedia—$5. Dog World Magazine $2 for 1 year, 5 years $5. Judy Publishing Company, 3323 Michigan Blvd., Chicago 16.

POSITION WANTED by February, 1943, Graduate. Experienced, draft exempt, Arkansas and Oklahoma licenses. Mixed or small animal practice. Would consider buying. Answer giving complete detail. Address No. 471 care of VETERINARY MEDICINE.

"HORSESHOES OF INTEREST TO VETERINARIANS" by the late Prof. Henry Asmus, Cornell University. This new book on horseshoeing contains 164 illustrations of shoes for both healthy and defective hoofs and for several kinds of lameness, with full description of each. Price $1.00. Address Mrs. Henry Asmus, 7 Reservoir Ave., Ithaca, N. Y.

A species of mold, botanically related to that which produces penicillin, forms a superior enzyme, which turns the starch of grain into sugar for making alcohol more rapidly and more completely than the malt enzyme used heretofore.

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"Sulpho Dip"

The 1-2-3-4-5 for using this water soluble sulphur compound.

Sold to Veterinarians ONLY

30 days' approval

1. On large and small animals—uniformly satisfactory for treating parasitic skin diseases where sulphur therapy is indicated.
2. Contains no cresylic acid, coal tar or creolin. Safe for use on cats.
3. Miscible with many vegetable and some mineral oils.
4. Evaporates, leaving sulphur directly on surface where it is most effective.
5. About 95% deodorized. Generally leaves no objectionable odor.

(Fool-Proof in hands of the laity)

Sample FREE. Ask for Yours.

SULPHUR PRODUCTS CO.

Greensburg, Pa.

Representatives Wanted.

Possibility of the use of sawdust and waste wood for producing a high-protein stock food is creating interest among Mexican cattlemen. In many sections of Mexico large field cacti are hauled by the wagon load and dumped into cattle yards for food.

FLEX-O MEDICATED TEAT DILATORS

are the only cloth covered dilators that contain no wires which might cause further infection or serious injury to the teat canal.

The soft woven cloth furnishes soothing protection to the injured lining while tissues heal and carries the medication inside the teat canal directly to the seat of the trouble.

FLEX-O Dilators are made in two sizes, Regular or Large packed in antiseptic ointment, 24 to jar, price 50c. Price to veterinarians $4 per doz. jars prepaid.

DAIRY REMEDIES CO.
120 High Street, Montclair, N. J.

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AND HOLD THEM

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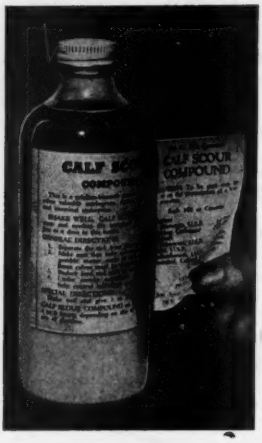
CALF SCOUR COMPOUND

with

VITAMINS



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VITAMIN A
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NIACIN
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12 OUNCE BOTTLES:

Each 75c
12 .....$6.00
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(Over $10.00 Prepaid)

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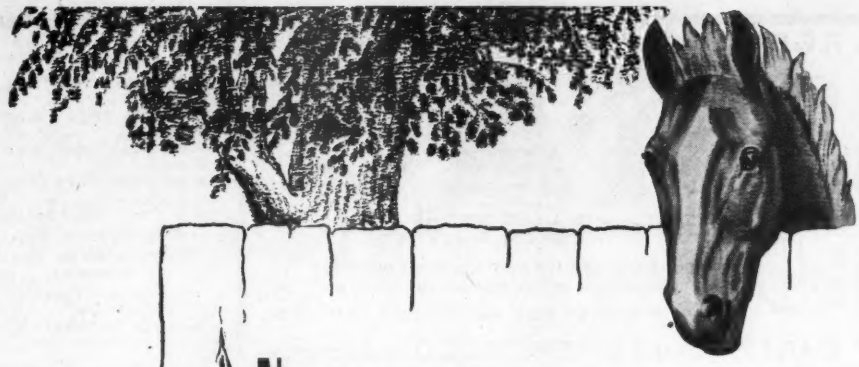
Finest Pharmaceuticals at Lowest Cash Prices

Write for Our New Catalogue **Jobbers Solicited**

The Army Postal Service has handled more than 40 million V-Mail letters in one month. During that period of time there were nearly 2½ million more V-Mail letters received from soldiers than were sent from the United States.



NUMOTIZINE *in Inflammation*

To counteract the pain and congestion in local inflammatory conditions, an application of the medicated emplastrum, Numotizine, is of considerable help.

By increasing the local circulation, promoting phagocytosis and reducing swelling, Numotizine acts with nature to aid repair.

Numotizine is easy to apply. Just spread on gauze, cotton or cloth, and hold in place with suitable bandaging. A single application lasts 8 hours or more. No heating is required, and it is easy to remove.

Indications: For relief of pain and congestion in:

CHEST CONDITIONS—Bronchitis, Colds, Pneumonia

SKIN—Abscesses, Glandular Swellings, Mastitis, Contusions

GENITO-URINARY—Orchitis, Metritis

BONES and JOINTS—Arthritis, Tendinitis, Bursitis, Sprains

Supplied in 4, 8, 15 and 30 oz. jars;
3½-lb. jars available on direct request

NUMOTIZINE, Inc.

900 North Franklin Street
CHICAGO • ILLINOIS

Formula:

Guaiacol	2.60	Methyl Salicylate	2.60
Beechwood Creosote	13.02	Sol. Formaldehyde	2.60
		C. P. Glycerine and Aluminum Silicate q.s. ad 1000 parts	

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M·A·C

ACCEPTED AND USED BY THE VETERINARY PROFESSION SINCE 1900

IN THE TREATMENT OF EQUINE LAMENESS INVOLVING BONE, BURSA OR TENDON

"M. A. C. HAS NEVER BEEN SUCCESSFULLY IMITATED"

CARTER-LUFF CHEMICAL CO., HUDSON, N.Y.

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SINGLE BOTTLE $ 2.00
¼ DOZEN
1 BOTTLE FREE 5.00
½ DOZEN
2 BOTTLES FREE 8.00
1 DOZEN
4 BOTTLES FREE 15.00
2 DOZEN
4 BOTTLES FREE 25.00

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PHENOTHIAZINE
Unadulterated—Medicinal Grade

Prepaid Prices to Veterinarians

50 lb. drum.	$42.50	10 lb. drum.	9.00
25 lb. drum.	22.50	5 lb. drum.	4.75
10 1 lb. cans			$10.00

(Freight not paid)

160 lb. bag—Glauber's Salts (Tec) $2.40

Also Bicarbonate of Soda
Copperas—Epsom Salt (Tec) Copper Sulphate—Iodine—Niacin *Priced on request.*

AMERICAN NATIONAL MINERAL CORP.
HILLSBORO, INDIANA

More than 70% of the nation's supply of lard comes from 13 corn belt states, which have an average of 71 hogs to each square mile—Iowa has an average of 267 hogs per square mile.

War Food Order 99, controlling the use of vitamin A in mixed feed for poultry and livestock, was terminated October 14.

The Colorado College of Agriculture has found that when cows are fed early-cut alfalfa hay there is an increase of 73 pounds of butterfat per cow per year over that produced by cows fed alfalfa hay cut in full-bloom stage.

Brome grass, which stands dry, hot weather better than any other grass and recovers quickly from effects of drought, is becoming more popular every year. The grass is good for hay and pasture and grows well with alfalfa.

Packers operating under Federal inspection are required, effective October 15, to set aside 80% of all canner and cutter beef and 60% of choice, good, commercial and utility beef that meets army specifications, for government procurement.

GRANULAR VAGINITIS IN COWS

Many Veterinarians, particularly in Western Pennsylvania, find that

THERAPOGEN POWDER

gives far better results than any other preparation. Write for information.

THEODORE MEYER EST.
213 South 10th Street
Philadelphia, Pa.

Effective Convenient Economical

THE effectiveness of Mercurochrome has been demonstrated by more than twenty years of extensive clinical use. For professional convenience Mercurochrome is supplied in four forms—Aqueous Solution in Applicator Bottles for the treatment of minor wounds, Surgical Solution for preoperative skin disinfection, Tablets and Powder from which solutions of any desired concentration may readily be prepared.

Mercurochrome

(H. W. & D. brand of merbromin, dibromoxymercurifluorescein-sodium)

is economical because stock solutions may be dispensed quickly and at low cost. Stock solutions keep indefinitely.

Mercurochrome is antiseptic and relatively non-irritating and non-toxic in wounds.

Complete literature will be furnished on request.

HYNSON, WESTCOTT & DUNNING, INC.
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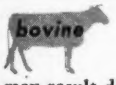
REAZOL

Pioneered by STRASENBURGH Research

THE TRUE SOLUTION FOR IMPROVED TOPICAL SULFONAMIDE THERAPY



Bovine Mastitis may result directly from infections caused by Streptococcus agalactiae or *mixtures* of Streptococci and Staphylococci. REAZOL contains both Sulfanilamide and Sulfathiazole, a combination which exerts a more specific action against mixtures of Streptococci and Staphylococci. Thus REAZOL provides a more complete and effective treatment of chronic bovine mastitis.

REAZOL has also proved effective in the treatment of nail punctures, wire cuts, fistulas and foot rot. It rids the wound of necrotic tissue and stimulates the granulation of new tissue.

Also, in canine practice REAZOL is effectively used in treating abscesses, bites, hematoma and suppurative otorrhea. It spreads uniformly, cleanses thoroughly and deodorizes the infection.

REAZOL is a *balanced, true* solution which contains in each fluid ounce:

SULFANILAMIDE.....20 grs. (1.296 gms.)
SULFATHIAZOLE.....20 grs. (1.296 gms.)
UREA.....40 grs. (2.592 gms.)
BENZYL ALCOHOL....3% (w/v)
IN A NON-AQUEOUS VEHICLE COMPOSED ESSENTIALLY OF PROPYLENE GLYCOL

REAZOL is available packaged in pints, gallons and 250 cc. rubber-stoppered vials. For further information write for Folder No. R-1.

R. J. STRASENBURGH Co.
PHARMACEUTICAL CHEMISTS SINCE 1886
ROCHESTER, NEW YORK

Defense AGAINST DISTEMPER

The one-injection method of immunizing dogs against distemper.

Medical science has made notable strides during the past decade. In the field of veterinary medicine one of the most outstanding contributions has been the modification of distemper virus by numerous serial passages through ferrets resulting in

Distemperoid Virus

(Canine Distemper Vaccine—Ferret Origin—Green Method)

A live non-pathogenic virus producing rapid immunity

Sold only to graduate veterinarians. Supplied in single-dose packages, 5-dose packages, and 10-dose packages.

For booklet and prices write to . . .

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FISTONE is unanimously agreed upon by veterinarians throughout the country as the medicine of choice for its efficacy and performance in the treatment of suppurative affections in horses and mules. FISTONE has a decided tonic effect which will be found beneficial in all horses that have received treatment for intestinal parasites.

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Trial Order—One dozen boxes (once only).....$ 8.00
Regular price—One dozen boxes..... 10.00
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For orders to be sent outside of United States add 20% to the above prices.

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Address.....

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Coming Meetings

United States Live Stock Sanitary Association, La Salle Hotel, Chicago, Dec. 6-8. Sec. R. A. Hendershott, Trenton, N. J.

New York State Veterinary College, annual conference for veterinarians, Jan. 3-5. Acting Dean, M. G. Fincher, Ithaca, N. Y.

Oklahoma Veterinary Medical Association, Hotel Skirvin, Oklahoma City, Jan. 8-9. Sec. J. B. Corcoran, Oklahoma City.

Cornell University Conference for Veterinarians, New York State Veterinary College, Ithaca; Jan. 3-5. M. G. Fincher, acting dean of college.

State Board Examinations

The Indiana Veterinary Examining Board will hold examinations January 10, 1945. Address inquiries to J. L. Axby, Sec., 209 State House, Indianapolis 4.

The Illinois Department of Registration and Education will hold an examination on December 4-5, 1944, at the Department's headquarters, 600 S. Michigan Ave., Chicago. Applications should be filed with the superintendent, Department of Registration and Education, Springfield. The application fee is $20.00. Address inquiries to L. A. Merillat, chairman, 600 S. Michigan Ave., Chicago 5.

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AND HOLD THEM

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Stilbestrol

For Large and Small Animals

4 mg. per cc

A synthetic estrogenic hormone used in:

Anestrus and pyometra
Retained placenta
Retained mummified fetus
Regulation of estrous cycle
Non-specific vaginitis
in all species.

Packaged in 10 cc and 60 cc vials
(Each cc containing 4 mg. Diethylstilbestrol)

10 cc vial.....$0.50 **Six 10-cc vials.....$2.85**
60 cc vial.....$1.50

A convenient MAIL-ORDER item, from our branches, or direct

(For detailed description, see the NORDEN CATALOG, page 154)

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EAR MITES

VETERINARY DIVISION
The Doho Chemical Corp., New York-Montreal-London

Meats 35% of September Lend-Lease Deliveries

According to the War Food Administration, canned, frozen, cured and other meat products accounted for 189,236,632 pounds or 35% of the total deliveries under lend-lease in September. Deliveries of meat products during the month were some 5,000,000 pounds less than August deliveries.—*National Provisioner.*

■

Deaths of Veterinarians

W. T. Bollmeier, 56, East St. Louis, Mo., Ohio State University '18; served in World War I; April 4.

You will enjoy more and better service when you take proper care of your

Oster

SMALL ANIMAL CLIPPER

Don't risk ruining equipment you are not able to replace. Your Oster equipment deserves the best care you can give it. Remember, new electric clippers are not available. And the same is true of some repair parts. Within the limitations of these conditions, we stand ready to help you in any way we can.

John Oster Manufacturing Co.
Racine, Wisconsin, U. S. A.

FOOTPRINTS
of a
HAPPY DOG
. . . HE DOESN'T STOP TO SCRATCH

In dry eczema, COLLO-SUL LOTION* gives rapid relief from itching, softens crusts and scales, and favors the restoration of normal, healthy skin. It can be used on the most tender skin and does not cause gastritis if licked by the animal.

Available in 1 pint and 1 gallon bottles. Detailed information on request.

*Trade-mark Reg. U. S. Pat. Off.

COLLO-SUL LOTION

(active colloidal sulphur)

CROOKES LABORATORIES, INC.
305 East 45th Street, New York 17, N. Y.

Do you have a set of

THE MERILLAT-CAMPBELL

"VETERINARY HISTORY"

A tabular list of the subjects discussed in this history includes:

Short account of veterinary medicine from dawn of civilization to the present.
Development of the animal industry in the United States.
Veterinary medicine in America before the Civil War.
Veterinary medicine during the Civil War and post war period.
The founding and growth of veterinary colleges.
The development of veterinary practice during the nineteenth century.
The struggle for army veterinary legislation.
The enactment of veterinary practice laws.
The growth of a veterinary literature in the United States.
The long struggle for higher standards of veterinary education.
Many biographical sketches of veterinarians who have influenced the development of veterinary medicine in the Untied States and Canada.
The origin, growth and achievements of veterinary research.
A veterinary history of the Spanish-American War.
A history of the veterinary service in the United States during the World War.
A history of the U. S. veterinary service in France during the World War.
An account of the Veterinary Corps schools during the World War.
A record of veterinary laboratory service during the World War.
A record of veterinary food inspection during the World War.
A description of the present Veterinary Corps of the United States Army.
Halftone illustrations of prominent veterinarians since 1850.
Halftones of more than a thousand veterinary officers of the World War.
Illustrations of buildings and equipment of present and past veterinary colleges.
An account of veterinary associations and their achievements.
History of each of the present veterinary colleges, with buildings, deans, entrance requirements, course, graduates by years and prominent alumni.
History of organized veterinary medicine in the United States.
A large number of halftones showing places, individuals and groups of veterinary interest.
Special chapters by: Drs. C. J. Marshall, C. E. Cotton, F. H. Davis, J. P. Turner and W. H. Wright.

Including reference matter as follows:

List of foreign veterinary colleges, with dates founded.
List of veterinary colleges in North America, with dates founded.
List of state veterinary associations with dates founded.
List of officers and meetings of the U. S. V. M. A. and of the A. V. M. A., with dates.
List of army veterinarians prior to 1916, with service record.
List of veterinary officers (2313) during the World War, with service record.
List of Veterinary Hospitals of the World War and their commanding officers.
List of Division Veterinarians during the World War and their assignments.
List of officers in post war Veterinary Corps and of veterinary reserve officers.
Official Documents of the World War of veterinary interest.
List of veterinary books published in this country, 1793-1861.
List of veterinary books published in this country, 1861-1900.

VETERINARY MILITARY HISTORY OF THE UNITED STATES
By L. A. Merillat and D. M. Campbell

Two Volumes, 1172 Pages, Profusely Illustrated
Price $10.00 Prepaid

Order it on approval: Keep it a week. If you are not entirely satisfied with it, return it.

Veterinary Magazine Corporation

7632 S. CRANDON AVENUE **CHICAGO, ILLINOIS**

Getting his share of the $125,000,000 *"animal and poultry health goods" business*

It is claimed that the "animal and poultry health goods" business in the U. S. totals $125,000,000 every year. This business rightfully belongs to the veterinarian. Here is how one practitioner gets his share:—

From Dr. C. E. Larsen, Rushville, Ind.:—"About 'animal and poultry health goods' dispensing. Fellow veterinarians may be interested in these facts:—

"Here is a picture of only a part of my drug room. It gives some idea of my display, counter, register, refrigerator, etc.

"I started dispensing in Nebraska in '22. I had a wonderful drug and merchandising business worked up there when I left in '38.

"Here, in Rushville, I handle everything in the dispensing line. Carry $5,000 in veterinary specialties from analgesics to zinc ointment. Once farmers know you have a complete stock they would rather trade with the veterinarian than go to a retail store. We try to keep our place spotlessly clean as 50% of our business is with farm women.

"Of course I keep Vitamineral Supplements in stock. Wherever I place them, everyone comes back for more.

"I believe the remedy business definitely belongs under the watchful eyes of the veterinarian. Practitioners who dispense 'use it yourself remedies' will not only make more money for themselves, but provide a worthy, money-saving service to all their clients."

(signed) Dr. C. E. Larsen.

The January, 1945, issue of the "Vitamineral News" will carry a story entitled, "Are we throwing $125,000,000 down the river?" If you are not on our mailing list write for a copy of this January issue. You will be astounded at the startling facts this article reveals.

Vitamineral Products Co., Peoria 3, Illinois

Via-D-Mineral ● Viamineral ● Con-o-mineral ● Viaferm

2·MERKA·B . . . Nationally recognized specific treatment for animal eczema of mycotic origin now distributed in New England by

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Price of 2-MERKA-B—$3.00 Pint—$18.50 Gallon

Delivered prepaid if payment accompanies order. IF NOT AVAILABLE FROM YOUR SUPPLIER, ORDER DIRECT.

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MIDDLESEX UNIVERSITY

School of Veterinary Medicine

Waltham, Massachusetts

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Accelerated war-time course leads to D.V.M. degree. New buildings for dormitories, classrooms, laboratories, animal hospital, clinic, and live stock, or 100-acre campus.

High school graduates accepted for the one-year preveterinary college course required for admission to the School of Veterinary Medicine.

Write for catalogue to

EDGAR A. CROSSMAN, M. V. D.

Dean of the School of Veterinary Medicine

John S. Dade, 81, Boise, Idaho, Ontario Veterinary College 1894; was chief inspector for Idaho State Sheep Commission for 22 years; May 11.

N. J. Kelleher, Ripley, Ontario, Ontario Veterinary College '19; May 26.

Wm. A. Ferry, Sandusky, Ohio, Ontario Veterinary College '06 and Chicago Veterinary College '07; June 3.

Valentine Stang, 68, Berlin, Germany, Veterinary College of Berlin; attended the International Veterinary Congress in New York in 1934; June 18.

H. H. Bowling, 59, Butler, Ky., Cincinnati Veterinary College '15; June 27.

K. E. Larson, Willmar, Minn., Texas A. & M. College '41; was one of four brothers, all veterinarians and was killed in automobile accident; July 9.

Z. Carl Boyd, Raleigh, N. Carolina, Kansas City Veterinary College '07; had served in B.A.I. many years; July 15.

Edward H. Fitch, 71, McHenry, N. D.; was in B.A.I. for past 10 years; July 17.

Arthur Paul, 74, Escondido, Calif., McKillip Veterinary College '04; August 15.

Walter H. Martin, El Reno, Okla., Iowa State College '03; was kicked by a horse he was treating which resulted in his death; August 25.

Adelbert B. McCapes, 79, Fruita, Colo., Ontario Veterinary College 1888; practiced 10 years in S. Dakota, then moved to Colorado and served as State Veterinarian in 1904-05

HE IS *Ready Freddy* NOW!

The veterinarian saw his job and he "done" it with

PERANDREN*

INDICATED IN: Sexual impotence in male animals, difficulties in mating, cryptorchidism. Average dose for bulls .50 mg.

Perandren, testosterone propionate, is available direct or through dealers at the following prices:

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5 mg. solution—cartons—	3s	$ 1.80
	6s	3.20
	50s	23.20
10 mg. solution—cartons-	3s	2.88
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25 mg. solution—cartons—	3s	5.00
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10 cc. VIAL (rubber-capped)

5 mg. to each cc.	4.15
10 mg. to each cc.	6.90
25 mg. to each cc.	12.45

Dealers handling CIBA products:

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*Trade Mark Reg. U. S. Pat. Off.

CIBA *Pharmaceutical Products, Inc.*

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NEW LOW PRICES

PHENOTHIAZINE POWDER

12—1 lbs. (case).....80c per lb.
10 lb. drum.....77c per lb.
25 lb. drum.....75c per lb.
150 lb. drum.....65c per lb.

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Accurately measured therapeutic dose of phenothiazine in one tablet for sheep, swine, cattle and equines.

25 gram—Box of 25.....$2.50
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12½ gram—Box of 25..... 1.40
12½ gram—Box of 100..... 5.00
2 gram—Bottle of 100..... 1.00
0.5 gram—Bottle of 100..... .50

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8 VITAMINS HIGH POTENCY

Active Ingredients in Each Capsule:

Vitamin A (Fish Liver Oils)	5,000 U.S.P. units
Vitamin D (Synthetic)	800 U.S.P. units
Vitamin B_1 (Thiamin Hydrochloride 1.5 mg)	500 U.S.P. units
Vitamin B_2 (G) (Riboflavin 2 mg)	2,000 Gamma
Alphatocopherol	1 mg
Calcium Pantothenate	1,000 Gamma
Vitamin C (Ascorbic Acid 30 mg)	600 U.S.P. units
Nicotinamide	5 mg

Bottle of 100.....$ 1.83
Bottle of 1000..... 16.00

Sulfanilamide Powder U.S.P.

1 lb. bottle.....$1.48 per lb.
5 lb. drum..... 1.45 per lb.
10 lb. drum..... 1.43 per lb.
25 lb. drum..... 1.40 per lb.
100 lb. drum..... 1.25 per lb.

Sulfathiazole Powder U.S.P.

1 lb. bottle.....$4.25 per lb.
5 lb. bottle..... 4.20 per lb.

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Sodium Sulfathiazole Powder

1 lb. bottle.....$4.25 per lb.

Sulfapyridine Powder

1 lb. bottle.....$7.50 per lb.

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SPECIAL

DAIRMOL DUSTING POWDER

FOR GRANULAR VAGINITIS

Antiseptic **Astringent**

"THE DAIRMOL WAY"

Compounded under the direction of two veterinarians of exceptional experience.
Highly recommended by leading herdsmen as the best treatment for the purpose.
Extensively used among prominent practitioners.

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and where he practiced for 37 years; survived by son A. M. McCapes, Professor of Veterinary Science, Calif. Polytechnic Institute; September 21.

Henry W. Dustan, 66, Morristown, N. J., Cornell University 1898; practiced in Morristown over 45 years, succeeding his father in practice; September 30.

Horatio L. Van Volkenberg, 51, Bryan, Texas, Cornell University '18; was professor of parasitology and head of the Department of Agriculture, Texas A and M College; had served in Alaska and in Puerto Rico for the U. S. Department of Agriculture, before he joined the veterinary faculty at College Station in 1937; October 13.

Calcium Gluconate

with or without Dextrose

Will not precipitate.
Will not freeze out.

Contains no other Mineral than Calcium.

1 Doz. 250CC.....$6.00
1 Doz. 350CC..... 7.20
1 Doz. 500CC..... 7.80

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From fifteen years experience came

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FIFTEEN YEARS of extensive work on distemper has taught us that different dogs rarely respond in the same manner to injection of canine distemper virus.

For this reason, the safest and most practical procedure is to protect puppies with one or two preliminary vaccinations of a killed virus vaccine, followed by the injection of a standardized distemper virus in 14 to 21 days.

This procedure will provide life-long immunity with maximum safety!

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Informal and Informational Radio Program
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DEC. 15 Dr. R. E. Dyer
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"Tropical Diseases"
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Is recovered from the blood of adult dogs originating in a large urban area. Besides containing native antibody against most common infectious diseases of dogs, it is hyperimmune against the virus of canine distemper.

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Six weeks after the first killing frost is the time to have your veterinarian treat your horses and mules for bots and round worms. Dividends are—less colic, better utilization of feed and good gain on colts. At the same time the horses are "wormed" have the teeth of all horses inspected.—*Successful Farming.*

■

"Beulah," daughter of Borden's famous Elsie, was responsible for the sale of more than $1,300,000 War Bonds. She was bought from Bordens for $525,000 in War Bonds by Quaker Oats Company, which company decided to give Beulah to a deserving "Future Farmer" and 4-H'er—the boy selected was 16-year-old Bob Linquist of Kewanee, Ill., a member of the 4-H whose father had been one of the first 4-H'ers twenty-five years ago.

■

LIVESTOCK HEALTH ODDITIES
AT ONE TIME, CONTAGIOUS PLEURO PNEUMONIA THREATENED TO WIPE OUT AMERICA'S ENTIRE CATTLE INDUSTRY
DISCOVERY OF THE CAUSE OF "BLACKTONGUE" DISEASE IN DOGS LED TO THE CURE OF HUMAN PELLAGRA
ENOUGH ANTI-HOG CHOLERA SERUM IS PRODUCED IN THE UNITED STATES EVERY YEAR TO FILL A TANK 200 FEET LONG 50 FT. DEEP and 50 FT. WIDE

American Foundation for Animal Health

According to the estimates of the American Foundation for Animal Health, screw-worms are causing livestock losses of $10,000,000 per year.

■

After 52 years in the veterinary profession and 45 years in the public service, Dr. J. S. Grove, Dallas, Texas, retired Sept. 30, 1944.

Doctor Grove was graduated from the Ontario Veterinary College in 1892. He spent 32 years in the meat inspection service of the B.A.I. including 15 years as Inspector-in-Charge at Oklahoma City. After retiring from the Federal service, he was superintendent of the municipal abattoir at Austin, Texas, for two years and for the past eleven years he has been Inspector-in-Charge of municipal meat inspection at Dallas.

Over a period of 7 years at the North Louisiana Experiment Station, according to their extension leaflet No. 6, sudan grass produced 45.8% more milk per acre than soybeans when grazed. Milk cows grazed on sudan produced 1,746 lbs. milk per acre with an annual return of $22.30 per acre over the value of supplemented grain feed.—*Prairie Farmer.*

■

The chief of the Meat Inspection Division, Dr. George E. Totten, retired Oct. 27. This completes 46 years of service with the Bureau of Animal Industry of U. S. Department of Agriculture. Doctor Totten was succeeded by Dr. Albert R. Miller, assistant chief of the Meat Inspection Division, who is a graduate of the Iowa State College School of Veterinary Medicine. He has been in the Meat Inspection Division for a number of years.

■

New President for Gaines

Edward M. King, who has held executive offices with General Foods, has been elected president of Gaines Food Company, Inc., to succeed W. E. Armstrong, resigned. Mr. King announced that "with our extended research activities [Gaines Research Kennels, Ridgefield, Conn.] under Mr. Hartnett, and our well-developed post-war plans, we hope to make an even greater contribution to the dog's welfare in the future than we have made in the past."

■

Stallions Wanted

The remount division of the Army Quartermaster Corps is in need of stallions for the Army's horse breeding program. Persons with stallions for sale may obtain further particulars by writing the headquarters of the Remount Area in which they live. The addresses of the several remount area headquarters are given below.

The seven existing remount areas of the Army Quartermaster Service are being consolidated into five areas to effect greater economy in administration.

Under the new allocation the remount areas will be:

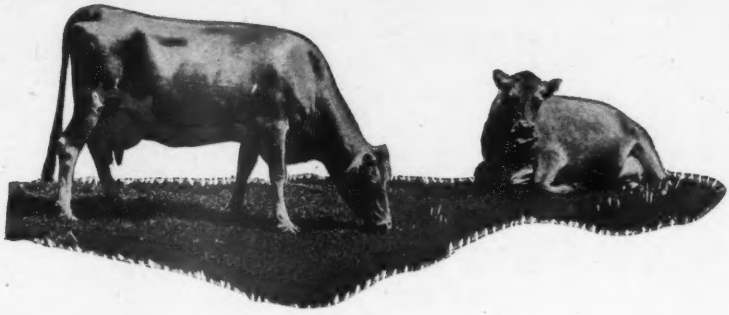
Western Remount Area, including Arizona, Utah, Nevada, Idaho, Washington, Oregon and California; headquarters at Pomona, Calif.

Northwestern Remount Area, including North Dakota, South Dakota, Nebraska, Colorado, Wyoming, Montana; headquarters at Colorado Springs, Colo.

Southwestern Remount Area, including Kansas, Oklahoma, Texas and New Mexico; headquarters at San Antonio, Texas.

Central Remount Area, including Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Ohio, Tennessee and Wisconsin; headquarters at Lexington, Ky.

Eastern Remount Area, including the remainder of the states; headquarters at Front Royal, Va.



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DIETHYLSTILBESTROL exerts a pronounced estrogenic effect which is manifested by histologic changes in the uterus, vagina and breasts. In animal diseases it has been found to be highly effective, particularly in the control of incontinence of urine in spayed bitches, removal of placenta and the treatment of pyometra in cattle. In addition, it has proved useful in some cases of false pregnancy in bitches and in some forms of anestrus in cows and heifers.

HOW SUPPLIED

Ampuls (in Oil) 0.5 mg. in 1 cc., and 1 mg. in 1 cc., each in boxes of 5 and 25 ampuls; 25 mg. in 1 cc. in boxes of 10 ampuls.

Tablets 0.1 mg., 0.5 mg., 1 mg. and 5 mg. in bottles of 50, 250 and 1000.

Effective orally as well as parenterally

Write for literature giving the essential details, including discussion of contraindications, side effects, methods of administration and dosage.

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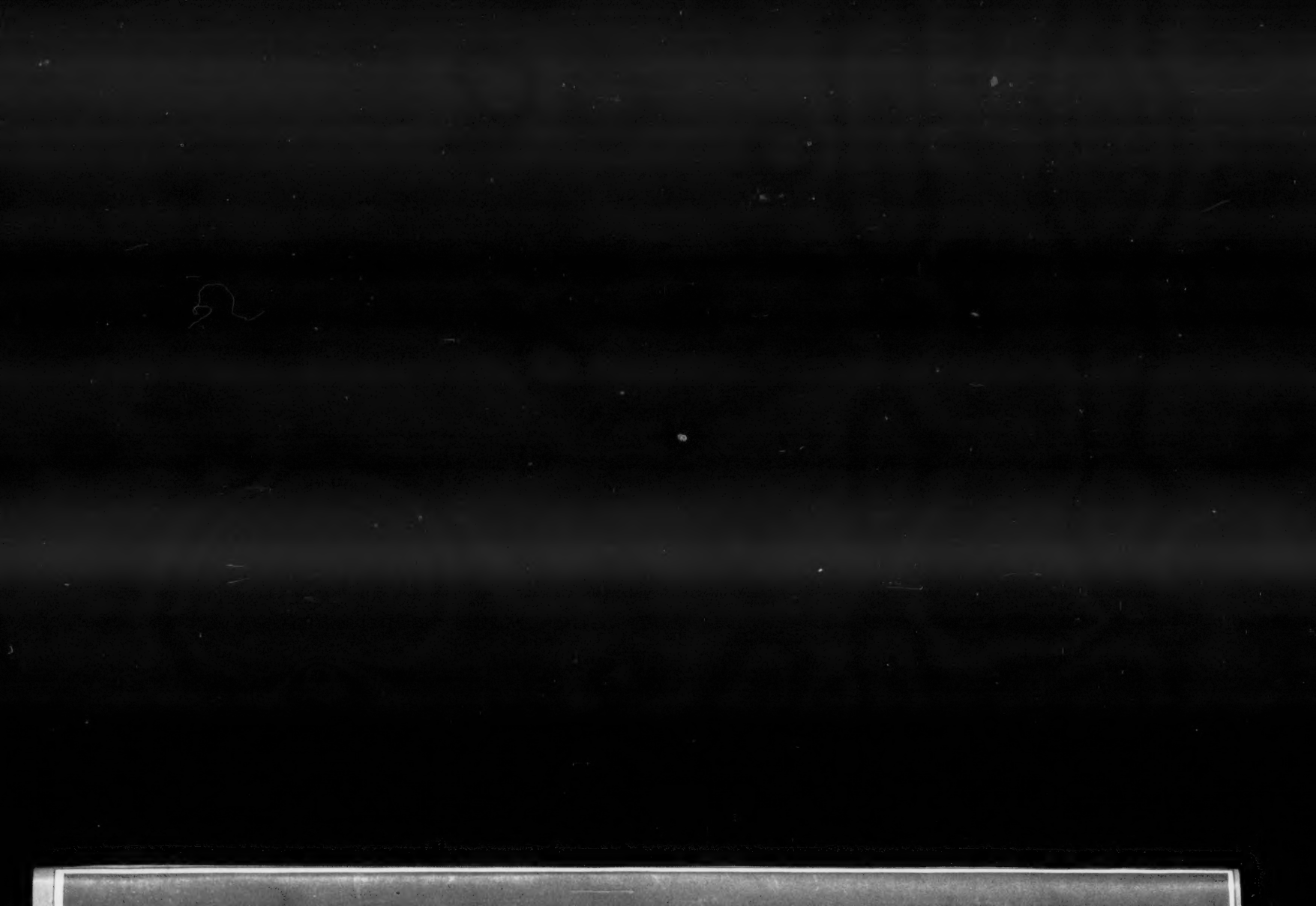
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Look to the American Middlewest
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because the advocates of high standards for veterinary science, as distinguished from exponents of incompetent practices, are winning the battle against the major diseases of food-producing animals;
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THE MIDDLEWEST IS THE WORLD'S COMMISSARY IN THE PRESENT EMERGENCY BECAUSE THE COMPETENT SEGMENT OF VETERINARY MEDICINE HAS THUS FAR SUCCEEDED IN KEEPING COMMAND OF THE DISEASE-FIGHTING FORCES.
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